977/2

Vol. 977 Number 2

# OFFICIAL GAZETTE

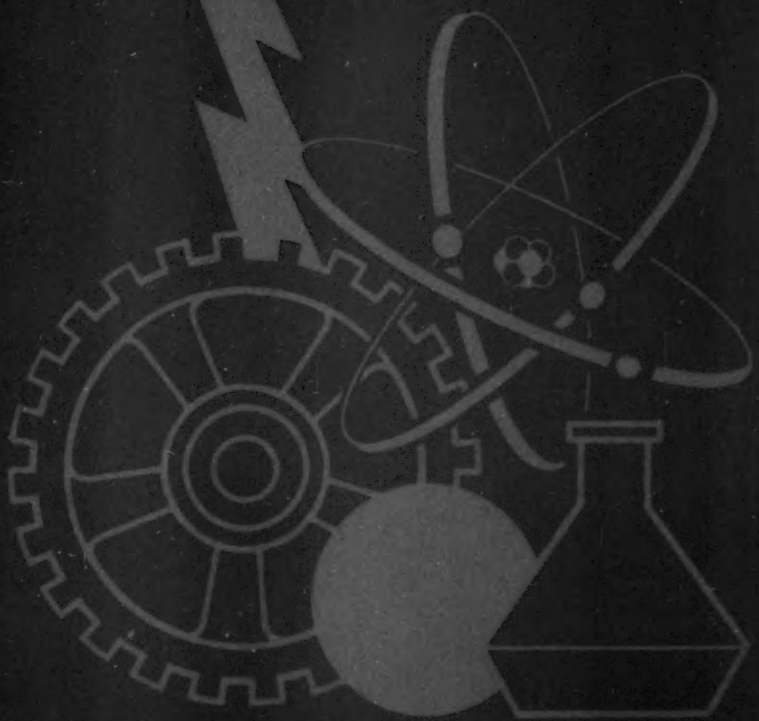
of the

## UNITED STATES PATENT AND TRADEMARK OFFICE

RECEIVED
MIAMI UNIVERSITY
LIBRARIES
DEC 8 1978
DEPOSITORY
DOCUMENTS DEPARTMENT

PATENTS

December 12, 1978



U.S.
DEPARTMENT
OF COMMERCE

Patent
and
Trademark
Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

# OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

December 12, 1978 Volume 977 Number 2


## CONTENTS


| | Page |
|---|---|
| Patent and Trademark Notices | |
| Patent Cooperation Treaty Information | 977 OG 8 |
| Patent and Trademark Office Board of Appeals Vacancy | 977 OG 8 |
| Payment of Additional Fees for Claims | 977 OG 8 |
| Patent Suits | 977 OG 8 |
| Further Guidelines Relating to 37 CFR 1.175 and 1.291 as Amended Effective March 1, 1978 | 977 OG 11 |
| Reissue Applications Filed | 977 OG 14 |
| Patent Notices | |
| Certificates of Correction for the Week of December 12, 1978 | 977 OG 15 |
| Adverse Decisions in Interferences | 977 OG 15 |
| National Technical Information Service | 977 OG 15 |
| Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries | 977 OG 19 |
| Condition of Patent Applications | 977 OG 20 |
| Reissue Patents Granted (29,860) | 339 |
| Plant Patents Granted (4,342) | 341 |
| Patents Granted | |
| General and Mechanical (4,128,902) | 343 |
| Chemical (4,129,412) | 513 |
| Electrical (4,129,742) | 605 |
| Design Patents Granted (250,496) | 659 |
| Index of Patentees | PI 1 |
| Indices of Reissues, Plants and Designs | PI 34 |
| Classification of | |
| Patents (Including Reissues) | PI 37 |
| Designs and Plants | PI 39 |
| Geographical Index of Residence of Inventors | |
| Patents (Including Reissues) | PI 40 |
| Designs | PI 41 |
| Change of Address Form and Subscription Order Form | Back Page |



**The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:**

**THE OFFICIAL GAZETTE (PATENTS SECTION), issued weekly, subscription $300.00 per annum for first-class mailing, also available as fourth-class mail at $200.00; foreign first-class mailing rates will be furnished upon request; single copies each, $4.00 domestic, $5.00 foreign.**

**THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly, subscription $88.40 per annum, foreign mailing $22.10 additional; single copies $1.70 each.**

**GENERAL INFORMATION concerning TRADEMARKS, price $1.50 each.**

---

**PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at 50 cents each; PLANT PATENTS in color, $1.00 each; copies of TRADEMARKS AND DESIGN PATENTS at 20 cents each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.**

---

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

# PATENT AND TRADEMARK OFFICE NOTICES

## Patent Cooperation Treaty (PCT) Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT) : Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of October 3, 1978.

DONALD W. BANNER,
Nov. 7, 1978. *Commissioner of Patents and Trademarks.*

## Patent and Trademark Office Board of Appeals Vacancy

In accordance with the provisions of 35 U.S.C. 7 vacancies on the Board of Appeals are filled by appointment of examiners-in-chief under the classified civil service. These appointments will be made at a salary of $47,500 per annum maximum.

Persons interested in being considered for this vacancy are invited to submit their applications to the address given below, on or before January 8, 1979. The duties, qualifications, and factors which will be considered in evaluating the candidates are described below.

*Duties:* Serves as a member of the Board of Appeals of the Patent and Trademark Office. As an examiner-in-chief, participates in its appellate and administrative responsibilities and exercises independent judgment on all matters before him or her on appeal subject to administrative and policy direction of the Commissioner. Appeals filed in accordance with 35 U.S.C. 134 and 37 CFR 1.191 through 1.198 of the Rules of Practice of the United States Patent and Trademark Office in Patent Cases involve complex legal and technical questions. The Board of Appeals has the sole power to hear and adjudicate appeals from decisions of the Primary Examiners as to patentability in applications for patent and for reissue of patents. Final decisions of the Board, if unfavorable to an applicant, may be appealed to the United States Court of Customs and Patent Appeals or civil action may be taken in accordance with 35 U.S.C. 145.

*Qualifications:* Candidates must possess (1) a minimum of five years of patent experience of which at least two years involved the exercise of independent judgment in a responsible position as typified by the exercise of Full Signatory Authority as a Patent Examiner or by comparable experience in some other position inside or outside the Patent and Trademark Office; (2) a law degree or be a member in good standing of the bar in any state, D.C., Puerto Rico, or any territorial court under the constitution; (3) a high degree of demonstrated competence in chemical technology; (4) ability to write clearly and logically; (5) comprehensive experience in patent prosecution, examination or administration which demonstrates a thorough knowledge and application of patent laws and rules of practice.

*Factors Which Will be Considered in Evaluating Qualified Candidates:* Candidates will be evaluated on the total range of their education, training and experience as well as supervisory appraisals of past performance and potential. *Note:* The qualifications of the proposed incumbent will have to be reviewed and approved by the Department of Commerce and by the U.S. Civil Service Commission before an appointment can be made effective.

Employees of the Department of Commerce may apply by submitting a completed Merit Promotion Interest Statement, Form CD 261, and a completed SF 171, Personal Qualifications Statement, if one is not already on file at the address given below. Persons who are not employees of the Department of Commerce should submit only a completed SF 171. Copies of Form SF 171 may be obtained at local post offices. The completed forms should be sent to:

U.S. Patent and Trademark Office
Office of Personnel
Building 2, Room 9C05
Crystal Plaza
Washington, D.C. 20231

Questions concerning this notice should be directed to Mr. Mark Meza or Ms. Donna Waters, Office of Personnel, Room 2-9C05, Telephone (703) 557-7624.

DONALD W. BANNER,
November 1978. *Commissioner of Patents and Trademarks.*

## Payment of Additional Fees for Claims

Section 41(a) 1 of Title 35 U.S. Code, provides that the Commissioner shall charge "On filing each application for an original patent, except in design cases, $65, in addition on filing or on presentation at any other time, $10 for each claim in independent form which is in excess of one, and $2, for each claim (whether independent or dependent) which is in excess of ten. . . . Errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner."

The Office accords filing dates to applications with insufficient fees provided the basic $65.00 filing fee is present. In such cases a notice is mailed requiring that the balance of the fee be paid within two months from the notification of the deficiency.

Occasionally applications contain informal claims that counsel feels should not be present. However, since alteration after execution and before filing is prohibited and could result in the application being stricken from the files, such applications must be filed in the form in which they are received from applicants. In the past the Office has charged fees for these informal claims, resulting in an unnecessary financial burden on applicants. In the future, applicants will be permitted to file with the application a preliminary amendment limited to cancellation of such claims, which will diminish the number of claims to be considered in calculating the filing fee to be paid. Any other changes should be the subject of a separate amendment.

On the other hand, if a preliminary amendment cancelling such claims does not accompany the application at the time the application is filed, the notification of the fee deficiency will inform applicant of his option of correcting the error by (1) paying the additional fee, or (2) filing an amendment cancelling claims, thereby reducing the number of claims to be considered in calculating the fee. However, it should be noted that once the fee for claims is paid, no refund will be made even though applicant later decides that certain claims are informal or otherwise unnecessary.

This change, which will become effective December 1, 1978, should benefit both applicants and the Office. It will alleviate applicants' financial burden and will also result in more efficient examination.

DONALD W. BANNER,
Nov. 9, 1978. *Commissioner of Patents and Trademarks.*

## Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

**3,248,099**, R. S. Bratko, INFRA-RED INDUSTRIAL OVEN; **3,785,763**, same, INFRA-RED BURNER, **filed** Oct. 31, 1977, D.C. W.D.N.C. (Charlotte), Doc. C-C-77-0308, *Slyman Manufacturing Corp.* v. *Energy Controls Engineering Corporation.*

**3,502,645**, D. G. Carmichael, WATER-INSOLUBLE BENZOTHIAZOLE MONOAZO DYES, **filed** Mar. 15, 1977, D.C. Del. (Wilmington), Doc. 77-94, *Martin Marietta Corp.* v. *Kewanee Industries, Inc.* Plaintiff's notice of dismissal without prejudice, 8-21-78.

**3,510,391**, Bolster, Tarbell and Mogg, PERLITE BOARD BONDED TO ORGANIC PLASTIC FOAM, **filed** Aug. 24, 1977, D.C. Del. (Wilmington), Doc. 77-327, *Grefco, Inc.* v. *Kewanee Industries, Inc.*

**3,517,254**, A. C. McNamara, Jr., CONTINUOUS LIGHTING SYSTEM FOR GASEOUS-DISCHARGE LAMPS WITH INCANDESCENT LIGHTS FOR STANDBY, **filed** May 24, 1976, D.C., S.D.N.Y., Doc. 76-C-2306, *Esquire, Inc.* v. *Leviton Manufacturing Company, Inc.* Voluntary dismissal, 8-30-76.

**3,527,010,** K. J. Brzezinski, BUILDING WALL CONSTRUCTION; **3,769,775, same, filed** Sept. 16, 1977, D.C., N.D. Tex. (Dallas), Doc. Ca3–77–1255–D, *Kawneer Company, Inc.* v. *Howmet Aluminum Corporation.*

**3,531,297,** Kielsmeier and Leprino, MANUFACTURE OF PASTA CHEESE, **filed** Jan. 12, 1978, D.C. Nebr. (Lincoln), Doc. Cv78–L–08, *Leprino Cheese Co.* v. *Mid-America Dairymen, Inc.*

**3,536,222,** W. V. Patnode, BUCKET ATTACHMENT FOR COMPACT TRACTORS, **filed** June 27, 1977, D.C. Minn. (St. Paul), Doc. C–3–77–302, *Wilford V. Patnode* v. *Research Products, Inc. Walter H. Pederson and James E. Olds.*

**3,549,575,** Payne and Chandler, JOINT SEALANT COMPOSITION, **filed** Dec. 2, 1977, D.C., W.D. Okla. (Oklahoma City), Doc. 75–1016–C, *Allied Materials Corporation* v. *Superior Products Company, Inc.* Plaintiff has not infringed United States Patent No. 3,549,575 and defendants are permanently enjoined from making any statements to the effect that plaintiff has infringed its patents.

**3,561,185,** Finsterwalder, Kern and Bock, ARMORING AND STRESSING ROD FOR CONCRETE, **filed** Dec. 8, 1977, D.C. S.D.N.Y., Doc. 77–C–5971. *Mencon Industries, Inc.* v. *Dyckerhoff & Widmann, A.G. and Dyckerhoff & Widmann, Inc.* **Same, filed** June 23, 1977, D.C.N.J. (Newark), Doc. 77–1251, *Dyckerhoff & Widmann A.G. et al.* v. *New Jersey Steel & Structural Corp. et al.*

**3,561,373,** C. R. Sievert, BAKERY CONVEYOR SYSTEM, **filed** July 28, 1978, D.C., S.D.N.Y., Doc. 78–C–3460 LBS. *Bakers Equipment/Winkler Inc.* v. *Bakers Perkins Inc.*

**3,581,507,** R. W. Stevens, TUNNELING SHIELD, **filed** Aug. 3, 1978, D.C., E.D. Wis. (Milwaukee), Doc. 78–494, *Milwaukee Boiler Manufacturing Company* v. *Mining Equipment Manufacturing Company known as Memco.*

**3,595,380,** E. S. Miller, SPROCKET DRIVE BELT RETAINER AND GUIDE MECHANISM FOR ARTICULATED LINK CONVEYOR BELTS, **filed** Dec. 12, 1977, D.C. Ariz. (Phoenix), Doc. C77–943–PhX WEC, *Eldon Miller* v. *Casino USA, Inc. et al.*

**3,604,116,** H. Shpuntoff, DENTAL IMPRESSION WAFER, **filed** July 24, 1978, D.C. S.D.N.Y., Doc. 78–C–3378 RLC, *Harry Shpuntoff* v. *Warner-Lambert Company.*

**3,605,200,** Vallinotto and Villata, CLAMP FOR FASTENING TUBULAR ELEMENTS, **filed** July 18, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c2569, *Bowthorpe Corporation* v. *Raymond Wenk.*

**3,615,087,** R. P. Hickman, WORKBENCHES, **filed** Dec. 29, 1975, D.C., E.D. Wis. (Milwaukee), Doc. 75–745, *Black & Decker Mfg. Co.* v. *Hempe Manufacturing Company, Inc.* Closed by permanent injunction, 4–12–78.

**3,629,450,** Gruenfeld and Wasley, ACIDS AS ANTI-INFLAMMATORY AGENTS, **filed** July 20, 1978, D.C. Ariz. (Phoenix), Doc. C78–588–Phx, *Ciba-Geigy, Limited and Ciba-Geigy Corporation* v. *Quimica Estrella, S.A. Crop Development, Inc. et al.*

**3,630,570,** R. F. Swenson, BUCKET-TYPE SEAT HAVING DRAIN AND VENTILATING MEANS, **filed** Jan. 20, 1978, D.C., E.D. Wis. (Milwaukee), Doc. 78–38, *Milso Manufacturing Company* v. *Engineering Products Company, Inc.*

**3,634,657,** Ballard and Rogers, ELECTRONIC READER MEANS FOR MAGNETIC CREDIT CARDS AND THE LIKE **filed** Feb. 2, 1978, D.C., C.D. Calif. (Los Angeles), Doc. CV78–478–1t1(KX), *A-T-O Inc.* v. *Automatic Parking Devices, Inc.*

**3,653,065,** A. D. Brown, Jr., ELECTROGRAPHIC RECORDING SYSTEM WITH INTERLEAVED ELECTRODE GROUPS, **filed** Sept. 9, 1977, United States Court of Claims, Washington, D.C., Doc. 450–77, *Gould, Inc.* v. *The United States.*

**3,654,382,** P. L. Rubright, GROMMET CONSTRUCTION, **filed** Feb. 3, 1975, D.C., E.D. Mich. (Detroit), Doc. 75–70211, *Arco Industries Corp.* v. *Chemcast Corp., C. J. Edwards, Phillip L. Rubright.*

**3,657,005,** Brown and Blumenthal, ELECTROGRAPHIC RECORD MEDIUM; **3,711,859, same**; ELECTROGRAPHIC RECORD SYSTEM HAVING A SELF-SPACING MEDIUM, **filed** Dec. 17, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c4275, *Gould Inc.* v. *Graphic Controls Corporation.* Memorandum opinion and judgment order entered, 8–3–77.

**3,663,785.** E. P. Hausermann, METHOD OF EROSIVELY SHAPING A MASTER DIE; **3,777,959,** J. S. Seney, APPARATUS FOR MONITORING AND CONTROLLING TENSION IN AN ADVANCING FLEXIBLE ELONGATE MATERIAL; **Re. 27,588,** E. P. Hausermann, APPARATUS FOR SHAPING ELECTRODES, **filed** Dec. 13, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c4652, *Grafon Corp.* v. *Elmer P. Hausermann.*

**3,666,516,** R. E. Dunning, HOT STAMP TAPE, **filed** Oct. 24, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c3595, *Avery Products Corporation* v. *Kurz-Hastings, Inc.*

**3,668,050,** H. F. Donnelly, SURGICAL DRAPE; **3,669,106,** M. S. Schrading, SURGICAL DRAPE WITH ADHESIVE ATTACHMENT MEANS, **filed** July 20, 1978, D.C., N.D. Ohio (Cleveland), Doc. C78–884, *Work Wear Corporation, Inc.* v. *Kimberly-Clark Corporation.*

**3,669,106.** (See 3,668,050.)

**3,672,187,** E. C. Simpson, FABRIC, **filed** Jan. 24, 1975, D.C., S.D.N.Y., Doc. 75–C–366 CLB, *Polylok Corporation* v. *Steinberg & Neumann, Inc.* Defendants SN and Disto and their respective officers and directors are hereby enjoined from further infringement.

**3,681,007,** H. A. Girard, CORE TRANSFER PROCESS, **filed** Aug. 28, 1974, D.C., W.D.N.C. (Charlotte), Doc. C–C–74–185, *Gaston County Dyeing Machine Co.* v. *Technical Equipment Company.* The patent in suit is valid and infringed, it is hereby ordered, adjudged and decreed, 2–9–78.

**3,711,859.** (See 3,657,005.)

**3,713,126,** J. C. Stettner, BURGLAR DETERRENT TIMING SWITCH, **filed** May 12, 1977, D.C., E.D. Mo. (St. Louis), Doc. 77–498C(2), *Novar Electronics Corp.* v. *World Finance Company.* Stipulation for dismissal, 5–23–78.

**3,713,368,** McDowell and Czernik, ROAD JOINT SEAL AND END DAM CONSTRUCTION, **filed** Sept. 15, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c3063, *Watson-Bowman Associates, Inc.* v. *Felt Products Mfg. Co. et al.* Counterclaim for unfair competition filed by Fel-Pro Inc. is dismissed with prejudice, 1–17–78.

**3,722,766,** Barrineau and Osborne, LADDER RACK, **filed** May 5, 1976, D.C., N.D. Ga. (Atlanta), Doc. C76–799–A, *Compact Van Equipment Co., Inc.* v. *Leggett & Platt, Inc.*

**3,742,731,** Phillips and Ludwig, GEM HAVING LIGHT PIPING FIBRES WITH CASES OF HIGH REFRACTIVE INDEX AND CLAD LAYERS OF LOWER HIGH REFRACTIVE INDEX, **filed** Feb. 3, 1978, D.C. Conn. (Bridgeport), Doc. B–78–35, *Queensbury Opal Co., Ltd.* v. *Paul S. Rogell et al.*

**3,758,051,** D. D. Williams, VELOCITY CONTROL AND ORIENTATION OF A SPIN-STABILIZED BODY; **Re. 26,887,** W. B. McLean, PROPORTIONAL NAVIGATION SYSTEM FOR A SPINNING BODY IN FREE SPACE, **filed** Dec. 5, 1974, D.C., M.D. Fla. (Orlando), Doc. 74–366–Orl–C–R, *Hughes Aircraft Company et al.* v. *Messerschmitt-Boelkow-Blohm, GmbH.* The Court finds that there is no genuine issue of material fact as to the use by the United States of the allegedly infringing apparatus, Aug. 23, 1977.

**3,760,424,** D. Leinoff, COMPOSITE FUR PELT AND METHOD OF MAKING SAME AND FUR COAT RESTRICTION, **filed** July 10, 1978, D.C., S.D.N.Y., Doc. 78–C–3088, *David Leinoff* v. *Valerie Furs Ltd. and Schreibman-Raphael Inc.*

**3,764,270,** Collier and Hoppesch, and Mamo, BREATH TESTING SYSTEM; **3,877,291,** Hoppesch and Schubert, PORTABLE BREATH TESTER, **filed** Sept. 12, 1977, D.C., C.D. Calif. (Los Angeles), Doc. C77–3380–AAH, *Alcohol Countermeasure Systems, Inc. etc.* v. *CEB Industries, Inc. etc. and Charles E. Bane.*

**3,769,116,** C. A. Champeau, METHOD OF MAKING A BUILDING MATERIAL FROM WASTE STOCK FROM A PAPERMAKING PROCESS, **filed** Aug. 26, 1977, D.C., E.D. Wis. (Milwaukee), Doc. 77–C–547, *Charles A. Champeau* v. *Menasha Corporation.*

**3,769,775.** (See 3,527,010.)

**3,777,959.** (See 3,663,785.)

**3,789,876,** B. L. Elkins, SHELF DIVIDER, **filed** Aug. 8, 1978, D.C., M.D. Tenn. (Nashville), Doc. 77–3377–Na-CV, *Lear Siegler, Inc.* v. *Tennsco Corporation.* The agreement and determination shall apply only to the parties to this action and be for the purpose of this action only, Aug. 8, 1978.

**3,785,763.** (See 3,248,099.)

**3,854,339,** R. Muller, PROCESS AND DEVICE FOR BALANCING OF ROTORS, **filed** Dec. 19, 1977, D.C., E.D. Mich., (Detroit), Doc. 77–72959, *American Hoffmann Corporation* v. *Balance Technology Inc.* Defendant has infringed said Letters Patent by manufacturing and selling devices for balancing rotors embodying the inventions described and claimed in one or more claims thereof.

**3,877,291.** (See 3,764,270.)

**3,934,759,** Giannella and Pellicciari, MULTIPLE DISPENSING HEAD FOR MILK SHAKE MACHINES, **filed** July 12, 1976, D.C.N.J., (Newark), Doc. 76–1341, *Vincent Arena* v. *Coldelite Corporation.* Order of dismissal of action, Mar. 30, 1978.

**3,949,522,** Kehl and Crist, GREENHOUSE, **filed** May 11, 1977, D.C., N.D. Fla. (Marianna), Doc. MCA–77–0217, *Hygroponics, Inc.* v. *American Greenhouse Systems, Inc., W. J. White and Michael Koppel.* Patents above owned by plaintiff, are good and valid in law and are enforceable; defendants and all those in privy therewith are hereby permanently adjoined from infringing any claims of the above patents, July 31, 1978.

**3,994,390,** Springer and Tuohy and Walter, MASSAGE DEVICE, **filed** July 7, 1978, D.C., S.D. Fla. (Miami), Doc. 78–290–C–JE, *Clairol Inc.* v. *Save Way Industries, Inc. et al.*

**3,995,102,** J. E. Kohaut, INSERT DEVICE FOR CABLES, **filed** Apr. 11, 1978, D.C. Conn. (Bridgeport), Doc. B–78–148, *Raceway Components, Inc.* v. *Dual-Lite, Inc.* **Same, filed** Nov. 10, 1977, D.C.N.J. (Newark), Doc. 77–2310, *Raceway Components, Inc.* v. *Dual-Lite, Inc.* Plaintiff's notice of voluntary dismissal of action, Nov. 11, 1977.

**3,995,825,** Ward and Ward, FORM TIE FOR CONCRETE FORM STRUCTURES, **filed** Aug. 19, 1977, D.C., W.D. Mo. (Kansas City), Doc. 77–0618–CV–W–2, *Wallties, Inc.* v. *Western Forms, Inc. et al.*

**4,004,719,** L. T. Weitzman, SLIDE DISPENSER APPARATUS; **D. 244,716,** L. T. Weitzman, SLIDE ACTION DISPENSER FOR PARTICULATE MATERIAL AND/OR GLOBULAR MERCHANDISE ITEMS, **filed** Dec. 29, 1977, D.C., C.D. Calif. (Los Angeles), Doc. CV77–4807–LTL, *Lane Weitzman et al.* v. *Ray Hernandez et al.*

**4,050,893,** Hancock and Sattler, ARRANGEMENT FOR PREPARING NATURAL TISSUE FOR INPLANTATION, **filed** Sept. 27, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c3606, *Hancock Laboratories, Inc.* v. *American Hospital Supply Corporation.*

**4,065,649,** Carter and Quain, PRESSURE SENSITIVE MATRIX SWITCH HAVING APERTURED SPACER WITH FLEXIBLE DOUBLE SIDED ADHESIVE BACKING AND CHANNELS INTERPOSED BETWEEN APERTURES, **filed** Aug. 14, 1978, D.C., E.D. Wis. (Milwaukee), Doc. 78–C–517, *Lake Center Industries* v. *W. H. Brady Co.*

**4,092,081,** D. W. Schmanski, ROADWAY/TRAFFIC DELINEATOR, **filed** Aug. 4, 1978, D.C., N.D. Calif. (Los Angeles), Doc. C78–1763, *Carson Manufacturing Co.* v. *Carsonite International Corp. et al.*

**4,096,287,** A. R. Kemp, PREPARATION OF A POWDERED SKIM MILK ADDITIVE, **filed** Aug. 18, 1978, D.C., N.D. Ill. (Chicago), Doc. 78c20075, *Pro-Mark Co.* v. *Crest Foods Co., Inc.*

**D. 225,954,** M. Schachel, COMBINED CLOTHES RACK AND STORAGE SHELF UNIT, **filed** Aug. 10, 1978, D.C., S.D. Fla. (Miami), Doc. 78–3634–C–WMH, *Michael Schachel and I.C.O. Corporation* v. *Jack M. Cooper, Gloria Marion and Closet Master, Inc.*

**D. 228,826,** D. R. Cleminshaw, LOOSELEAF BINDER, **filed** Aug. 29, 1975, D.C., N.D.N.Y. (Utica), Doc. 75–CV–431, *Hall and McChesney, Inc.* v. *Paul E. Killion, Inc.* Consent judgment, Dec. 22, 1976.

**D. 230,658,** W. R. Powell, MATERIAL HANDLING BOX; **D. 233,181,** same, STACKABLE MATERIAL HANDLING BOX, **filed** Oct. 20, 1977, D.C., E.D. Wis. (Milwaukee), Doc. 77–682, *Powell Pressed Steel Company* v. *Triple E. Corporation.* Action dismissed, Aug. 10, 1978.

**D. 233,181.** (See D. 230,658.)

**D. 233,907,** M. Michaeli, SCULPTURAL ORNAMENT, **filed** June 21, 1977, D.C., E.D.N.Y. (Brooklyn), Doc. 77–C–1285, *Novelty Crystal Corp.* v. *Crown Plastic Corporation.*

**D. 234,277,** Salmon and Hamilton, STOOL, **filed** July 12, 1977, D.C., E.D. Wis. (Milwaukee), Doc. 77–436, *Innovative Metal, Inc.* v. *Britt Industries, Inc. and Emil Muschinske.*

**D. 234,367,** J. Wolfard, OIL LAMP, **filed** May 6, 1977, D.C., N.D. Calif. (San Francisco), Doc. C–77–940–SAW, *Wolfard Glassblowing Co., etc.* v. *Joseph Magnin Co., etc.*

**D. 236,535,** Larsen and Dehring, VEHICLE LIGHT, **filed** Oct. 25, 1977, D.C., S.D. Ohio (Cincinnati), Doc. C–1–77–597, *Bates Industries, Inc.* v. *K-D Lamp Co. et al.*

**D. 237,798,** R. L. Fisher, COMBINATION HEATING AND COOKING STOVE, **filed** Sept. 9, 1977; D.C. Oreg. (Portland), Doc. 77–710, *Robert L. Fisher et al.* v. *Clifford E. Shirley et al.*

**D. 239,168,** D. G. Hart, VEHICLE WIND DEFLECTOR, **filed** Sept. 17, 1976, D.C., N.D. Ill. (Chicago), Doc. 76c3459, *Donald G. Hart and Creataform Ltd.* v. *Leisure Manufacturing Co., Inc.* Enter order of final judgment by stipulation of the parties, June 23, 1978.

**D. 242,181,** M. Davis, LUGGAGE CASE, **filed** Nov. 16, 1976, D.C., N.D. Ill. (Chicago), Doc. 76c4237, *Airway Industries, Inc.* v. *Suh-Won America, Inc.* Plaintiff's motion for entry of final judgment granted. Patent infringed; defendants injoined, June 14, 1977.

**D. 242,885,** L. H. Fister, Jr., CHAIR, **filed** Aug. 8, 1978, D.C., S.D. Fla. (Miami), Doc. 78–3578–C–JG, *August Inc.* v. *Directional Contract Furniture Corp.*

**D. 242,931,** Kaiser and Higgins, CIGARETTE HOLDER, **filed** Oct. 3, 1977, D.C., C.D. Calif. (Los Angeles), Doc. CV77–3695–RF, *John Herman* v. *Stanley Zahn.* **Same, filed** Oct. 3, 1977, D.C., C.D. Calif. (Los Angeles), Doc. CV77–3696–LTL, *John Herman* v. *Morris Karp.* **Same, filed** Oct. 3, 1977, D.C., C.D. Calif. (Los Angeles), Doc. CV77–3697–DWW, *John Herman* v. *Punch Press Products Inc.* **Same, filed** Oct. 3, 1977, D.C., C.D. Calif. (Los Angeles), Doc. CV77–3698–WPG, *John Herman* v. *Paul Klaus.* **Same, filed** Oct. 3, 1977, D.C., C.D. Calif. (Los Angeles), Doc. CV77–3693–RMT, *John Herman* v. *Winger (Irving).* **Same, filed** Oct. 3, 1977, D.C., C.D. Calif. (Los Angeles), Doc. CV77–3699–AAH, *John Herman* v. *Vern Hildebrandt etc.*

**D. 243,032,** D. R. Hodges, PLANTER, **filed** Nov. 11, 1977, D.C., C.D. Calif. (Los Angeles), Doc. CV77–4234–WPG, *Fitz and Floyd, Inc.* v. *Maurice Ceramics Inc. et al.* Final consent judgment that judgment shall be granted in favor of plaintiff and against defendants for patent infringement, Jan. 23, 1978.

**D. 243,217,** E. E. Warsaw, SOFA, **filed** Aug. 8, 1978, D.C., C.D. Calif. (Los Angeles), Doc. 78–3191–R, *Sheffield Furniture Corp.* v. *Michael Kaye Furniture Manufacturing, Inc.* **Same, filed** Nov. 25, 1977, D.C., M.D.N.C. (Greensboro), Doc. C–77–557–5, *Sheffield Furniture Corp.* v. *Carter Industries, Inc., Heritage House Furniture, Inc.* Consent judgment that Carter, Inc. and Heritage House Furniture are permanently enjoined and restrained from infringing on design patent of plaintiff, July 31, 1978.

**D. 243,330,** K. Pichler, EYEGLASS FRAME, **filed** June 26, 1978, D.C., N.D. Calif. (San Francisco), Doc. C–78–1394–SAW, *Optyl Corp.* v. *Optimark Corp.*

**D, 244,220,** R. J. De Brey, HOCKEY STICK, **filed** July 12, 1977, D.C. Minn. (Minneapolis), Doc. 4–77–C–243, *The Northland Group, Inc.* v. *Christian Brothers, Inc.*

**D. 244,716.** (See 4,004,719.)

**D. 245,468,** N. J. Horwitz, TABLE, **filed** Sept. 7, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c3329, *Silver Manufacturing, Inc.* v. *Chetek Furniture Co. et al.*

**D. 245,769,** M. Chihara, MAGNETIC MEDICAL NECKLACE, **filed** Mar. 22, 1978, D.C., S.D.N.Y., Doc. 78–C–1294 WCC, *Tokyo Kenki Kagaku Kogyo Kabushiki Kaisha* v. *National Pioneering Corporation.*

**D. 246,932,** N. Nelson, MINIATURE HURRICANE LAMP FOR DOLLHOUSES AND THE LIKE; **D. 247,456,** same, **filed** Mar. 30, 1978, D.C. Pa. (Philadelphia), Doc. 78–1021, *Nelson Tool and Machine Co., Inc.* v. *Wonderland Originals, Ltd.*

**D. 247,456.** (See D. 246,932.)

**Re. 26,887.** (See 3,758,051.)

**Re. 27,588.** (See 3,663,785.)

## Further Guidelines Relating to 37 CFR 1.175 and 1.291, as Amended Effective March 1, 1977

The experience with the above revised rules since their effective date has indicated the desirability of further guidelines relating to the manner in which they are to be implemented. The following guidelines are supplemental to those which have already been provided in the publication of the rules in the Federal Register of January 28, 1977 (42 F.R. 5588) (955 O.G. 1054, February 22, 1977), and in the earlier Guidelines published at 957 O.G. 11 on April 12, 1977. Copies of the latter two OFFICIAL GAZETTE publications appear as items 59 and 60 of the current "Consolidated Listing of Recent Official Gazette Notices" published at 966 O.G. 22–32. The present guidelines are also supplemental to the appropriate sections of the Manual of Patent Examining Procedure, e.g., Sections 1401–1401.12 relating to reissue, and Section 1309.02 relating to protests. Sections 721 and 721.01 of the MPEP contain guidelines to be followed if either a reissue or other application, or a protest relative to any application, raises questions of "fraud" or "violation of the duty of disclosure." Accordingly, the above-noted materials should be consulted in addition to these further guidelines, which are in themselves not intended to completely treat the subjects involved. For the most part, the guidelines herein merely identify and clarify existing requirements and practices. The Patent and Trademark Office has a general study underway of the procedures for handling reissue applications and protests which may result in future modifications in these guidelines.

Section 1.175(a)(4) of the revised rules recognizes that reissues may be filed to have the patentability of the original patent, without changes therein, considered in view of prior art or other information relevant to patentability which was not previously considered by the Office.

The experience to date reveals the need to clarify what should be filed by the applicant in order to seek the reexamination contemplated by sub-section (a)(4) and also the type and content of the examination which the examiner will give to applications filed under sub-section (a)(4).

First, sub-section (a)(4) does *not* contemplate, or permit, the filing of a reissue application without an oath or declaration. To the contrary, an oath or declaration is required, and such oath or declaration *must* comply with each of sub-sections (a)(4), (a)(5), and (a)(6). Thus, under sub-section (a)(4) the oath or declaration must particularly specify the "prior art or other information relevant to patentability, not previously considered by the Office," which the reissue applicant considers "might cause the examiner to deem the original patent wholly or partly inoperative or invalid." The reissue oath or declaration must also request, under sub-section (a)(4), that "if the examiner so deems, the applicant be permitted to amend the patent and be granted a reissue patent."

Under sub-section (a)(5), the reissue oath or declaration, including those filed under sub-section (a)(4), must particularly specify "the errors or what might be deemed to be errors relied upon, and how they arose or occurred."[1] This sub-section has two specific requirements, *both of which must be complied with* in, or by, the reissue oath or declaration. Thus, insofar as (a)(4) reissue oaths or declarations are concerned, the oath or declaration must particularly specify "what might be deemed to be errors." For example, if the reissue applicant is seeking reexamination in view of particular prior art or other information, the reissue oath or declaration must point out "what might be deemed to be errors" in patentability in view of such prior art or other information. More specifically, the oath or declaration, in appropriate circumstances, might state that some or all claims might be deemed to be too broad and invalid in view of references X and Y which were not of record in the patented files. Usually, a general statement will suffice. But where appropriate, such as where the pertinence of the new references X and Y are not evident, more specificity about "what might be deemed to be errors" should be provided. Of course, the reissue applicant does *not* have to, and presumably does *not*, agree that "errors" exist. However, the reissue applicant does have to, in the reissue oath or declaration of the sub-section (a)(4) type, particularly specify "what might be deemed to be errors relied upon."

[1] The text of sub-section (a)(5) is incorrectly reproduced in the July 1977 revision of Title 37 CFR. The text, as quoted herein, is correct.

In addition to specifying "what might be deemed to be errors relied upon," sub-section (a)(5) also requires "particularly specifying" "how they arose or occurred." This means, of course, that the reissue oath or declaration must specify the manner in which that which "might be deemed to be errors" "arose or occurred." For example, if the (a)(4) reissue is being filed for reexamination in view of prior art or other information, the reissue oath or declaration must indicate when and the manner in which the reissue applicant became aware of the possible error in the patent, e.g., third party allegation, discovery of prior art or other information subsequent to issuance of patent, knowledge of prior art or other information before issuance of patent with significance being brought out after issuance by third party, through allegations made in litigation involving the patent, etc. It is particularly important that the reissue oath or declaration adequately specify how "what might be deemed to be errors" arose or occurred. If the reissue oath or declaration does not particularly specify "how," i.e., the manner in which any possible errors arose or occurred, the Office will be unable to adequately evaluate reissue applicant's statement in compliance with (a)(6) that the "errors, if any, arose 'without any deceptive intention' on the part of the applicant."

Sub-section (a)(6) specifically requires that the reissue oath or declaration, including those filed under sub-section (a)(4), contain the averment that the "errors, if any, arose 'without any deceptive intention' on the part of the applicant." This requirement must not be overlooked in filing since the requirement for an absence of "deceptive intention" is a necessary part of any reissue application, including those of the (a)(4) type.

The significance and importance of sub-sections (a)(5) and (a)(6) must not be overlooked or minimized insofar as reissue oaths or declarations are concerned, including those filed under sub-section (a)(4). These sub-sections, to a large extent, enable the Office to make its determination required by statute that any error is "without any deceptive intention."

In addition to meeting the requirements of Sections 1.175 (a)(4)–(a)(6) insofar as the reissue oath or declaration is concerned, the reissue applicant, at the time of filing the reissue application, including the (a)(4) type reissue application, must also be aware of the requirements of 37 CFR 1.56, as revised effective March 1, 1977. Reissue applicants may, of course, utilize new Sections 1.97–1.99 to comply with the duty of disclosure required by Section 1.56. While Section 1.97(a) provides for filing of the prior art statement within three months of the filing of the application, reissue applicants are encouraged to file the prior art statement at the time of filing the application in order that such prior art statements will be available to the public during the two-month period provided by Section 1.176.

In situations in which the patent for which reexamination is being sought is, or has been, involved in litigation, which raised a question material to examination of the reissue application, such as the validity of the patent, or any allegation of fraud, the existence of such litigation must be brought to the attention of the Office at the time of, or shortly after, filing the application, either in the reissue oath or declaration, or in a separate paper, preferably accompanying the application as filed. Litigation begun after filing of the reissue application also should be promptly brought to the attention of the Office. The details and documents from the litigation, insofar as they are "material to the examination" of the reissue application as defined in 37 CFR 1.56(a), should accompany the application as filed, or be submitted as promptly thereafter as possible. For example, the defenses raised against validity of the patent, or charging fraud or inequitable conduct in the litigation, would normally be "material to the examination" of the reissue application. It would, in most situations, be appropriate to bring such defenses to the attention of the Office by filing in the reissue application a copy of the Court papers raising such defenses. As a minimum, the applicant should call the attention of the Office to the litigation, the existence and nature of any allegations relating to validity and/or "fraud" relating to the original patent, and the nature of litigation materials relating to these issues. Enough information should be submitted to clearly inform the Office of the nature of these issues so that the Office can intelligently evaluate the need for asking for further materials in the litigation. Thus, the existence of supporting materials which may substantiate allegations of invalidity or "fraud" should, at least, be fully described, or submitted. The Office is *not*, of course, interested in receiving

voluminous litigation materials which are *not* relevant to the Office's consideration of the reissue application. The status of the litigation should be updated in the reissue application as soon as significant events happen in the litigation.

*The Examination of Reissue Applications, Including Those Filed Under 37 CFR 1.175(a)(4)*

The examination of reissue applications, including those filed under sub-section (a)(4), will be in accordance with Sections 1401–1401.12, M.P.E.P. Attention is particularly directed to Section 1401.09, M.P.E.P. which refers to the two aspects of reissue examination, i.e., examination in the same manner as an original application and examination for compliance with the reissue statute and rules. The purpose of the present guidelines is to supplement those presently in existence and to emphasize certain points, particularly as they relate to reissue applications filed under sub-section (a)(4).

When examining the reissue application the examiner will consider whether or not applicant, in the reissue oath or declaration, has complied with each of the requirements of 37 CFR 1.175. For example, in all reissue applications, the reissue oath or declaration must comply with the requirements of the first sentence of 37 CFR 1.65. When the reissue application is other than the (a)(4) type, the reissue oath or declaration must comply with the appropriate sub-sections (a)(1) to (a)(3) and sub-sections (a)(5) and (a)(6). When the reissue application is filed under sub-section (a)(4), the reissue oath or declaration must also comply with sub-sections (a)(5) and (a)(6). Thus, all reissue applications must comply with sub-sections (a)(5) and (a)(6). If the examination reveals a lack of compliance with any requirement of Section 1.175, e.g., the requirements of sub-sections (a)(5) and/or (a)(6), a rejection will be made on the basis that the reissue oath or declaration is insufficient. See Section 1401.08, M.P.E.P. Under no circumstances will any reissue application be passed for issue without full compliance with 37 CFR 1.175.

Applications filed under sub-section (a)(4) will not, of course, be passed for issue without amendment, but will be rejected as lacking statutory basis for a reissue if *there are no other grounds for rejection*, since 35 U.S.C. 251 does not authorize reissue of a patent unless the patent is deemed wholly or partly inoperative or invalid. If a reissue filed under sub-section (a)(4) is subsequently amended thereby converting it into an application under sub-sections (a)(1) to (a)(3), *a supplemental reissue oath or declaration must be filed containing the appropriate averments.* If such a proper supplemental oath or declaration is not filed, a rejection will be made on the basis that the reissue oath or declaration is insufficient. The supplemental oath or declaration insures compliance with 35 U.S.C. 251 by providing appropriate averments relating to actual errors rather than possible errors.

If the examiner becomes aware of litigation involving the patent sought to be reissued during examination of the reissue application, and applicant has not made the details regarding that litigation of record in the reissue application, the examiner, in the next Office action, will inquire regarding the same. The following paragraph may be used for such an inquiry:

> "It has come to the attention of the examiner that the patent sought to be reissued by this application (is) (has been) involved in litigation. Any documents and/or materials, including the defenses raised against validity, or against enforceability because of fraud or inequitable conduct, which would be material to the examination of this reissue application are required to be made of record in response hereto. See 37 CFR 1.175(b)."

If the additional details of the litigation appear to be material to examination of the reissue application, the examiner may make such additional inquiries as necessary and appropriate under 37 CFR 1.175(b).

However, any application which indicates the existence of *a question* of "fraud" or "violation of the duty of disclosure" will be forwarded to the Office of the Assistant Commissioner for Patents pursuant to Section 721.01, M.P.E.P., as soon as the existence of *such question* is appreciated. For example, any reissue application which seeks reexamination in view of material prior art or other information known before issuance of the patent to a person having a duty under 37 CFR 1.56(a) must be forwarded under Section 721.01, M.P.E.P., to the Assistant Commissioner via the Group Director.

*The Filing of Protests Under 37 CFR 1.291*

The amendments to Section 1.291 reflected the increased value the Office places on appropriate written protests as an aid in avoiding the issuance of invalid patents. The present supplemental guidelines are in addition to those previously published and referred to above.

The nature of the protest, and the timeliness of its submission, are important factors in determining the consideration which is given the protest, and by whom it is considered. Insofar as the question of timeliness is concerned, the original publication of the rules at 955 O.G. 1054, the earlier Guidelines published at 957 O.G. 11, and Section 1309.02, M.P.E.P. adequately treat this question. Protests should obviously be submitted as early in the examination process as possible in order to be of maximum benefit to the Office in its examination of the application involved.

If the protest is being filed with regard to a reissue application, the protest should be filed within the two-month period following announcement of the filing of the reissue application in the Official Gazette, if it is at all possible to do so. If, for some reason, the protest of the reissue application cannot be filed within the two-month period provided by 37 CFR 1.176, the protest can be submitted at a later time, but protestor must be aware that reissue applications are "special" and a later filed protest may be received after action by the examiner, if submitted later than the two months provided by 37 CFR 1.176. In the event a protest is intended against a reissue application, but cannot be submitted within the two months provided following the O.G. announcement, the protestor can request an additional specified period within which to file the protest, explaining why the additional time is necessary and the nature of the protest intended. A copy of any such request for additional time to protest a reissue application beyond the two months provided must be served on the reissue applicant. The request for additional time should be directed to the appropriate Group Director. The requests for additional time beyond the two months provided will be *critically reviewed as to demonstrated need* before being granted since the delay of examination of a reissue application of another party is being requested. Accordingly, the requests should be made *only where necessary, for the minimum period required* and with a justification establishing the necessity for the extension.

Any protest filed alleging "fraud" or "violation of the duty of disclosure" should be directed to the attention of the Assistant Commissioner for Patents, Building 3, Room 11A–13. Protests based on grounds other than "fraud" or "violation of the duty of disclosure" should be directed to the attention of the Director of the particular examining group in which the application is pending. If the protestor is unable to specifically identify the application to which the protest is directed, but, nevertheless, believes such an application to be pending, the protest should be directed to the attention of the Assistant Commissioner for Patents, Building 3, Room 11A–13, along with as much identifying data for the application as is available.

As indicated in the earlier publications, e.g., Section 1309.02, M.P.E.P., every effort should be made by a protestor to effect service of the protest upon the attorney or agent of applicant who is of record or upon the applicant. The protest filed in the Office should reflect that service has been made. Only in those instances where service is not possible should the protest be filed in duplicate in order that the Office can attempt service. Of course, the copy served upon applicant or applicant's attorney or agent should be accompanied by a copy of each prior art or other document relied upon in the same manner as required by Section 1.291(a) for the Office copy.

*The Examiner's Consideration of Protests*

Protests other than those alleging "fraud" or "violation of the duty of disclosure" will be received by, or forwarded to, the Group Director of the examining group where the application is, or may be, pending and then referred to the appropriate examiner. If it is then, or later, discovered that a question of "fraud" or "violation of the duty of disclosure" exists, the application and the protest, will be forwarded to the Office of the Assistant Commissioner for Patents pursuant to Section 721.01, M.P.E.P.

If no allegations or questions of "fraud" or "violation of the duty of disclosure" are found to exist, the examiner will consider the protest and report the results of the consideration to the Group Director. If the protest has been timely

submitted, i.e., before final rejection or allowance, the examiner will consider each of the prior art or other documents submitted. At least those prior art documents which the examiner relies on in rejecting claims will be made of record by means of form PTO–892. If the examiner does not cite all of the prior art or other documents on form PTO–892, the examiner will place a notation in the protest paper adjacent to the reference to the documents which will include the examiner's initials and the term "checked."

If the protest is filed after final rejection or allowance of the application, the consideration by the examiner will depend upon the relevance of the prior art documents submitted and the point in time at which they are submitted. Documents which clearly anticipate or render obvious one or more claims will not be knowingly ignored. Prosecution of the application will be reopened where necessary. However, protestor must be aware that the likelihood of consideration by the Examiner decreases as the patent issue date approaches. Accordingly, protests must be filed early in order to ensure their consideration.

If the protest is not accompanied by a copy of each prior art or other document relied upon as required by Section 1.291(a), the protestor cannot be assured that the examiner will consider the missing document. However, if the examiner does so, the examiner will either cite the document on form PTO–892 or place a notation in the protest paper adjacent to the reference to the document which will include the examiner's initials and the term "checked."

If, upon considering the protest or any submissions subsequent thereto, the examiner considers it desirable to obtain applicant's comments on the protest before further action, the examiner will offer applicant an opportunity to file comments within a set period, usually two months.

The following suggested format can be used to offer applicant an opportunity to file comments on the protest:

> "A protest against the issuance of a patent based on this application has been filed under 37 CFR 1.291 on _____ and a copy (has been indicated as having been served on applicant) (is attached hereto). Any comments or response applicant desires to file before consideration of the protest must be filed by _____."

Section 1.291(a) indicates that protests are acknowledged and this acknowledgement will normally be made by the particular office to which the protest is ultimately directed for consideration. Protests alleging "fraud" or "violation of the duty of disclosure" will normally be acknowledged by the Office of the Assistant Commissioner for Patents. Other protests, i.e., those not alleging "fraud" or "violation of the duty of disclosure" will normally be acknowledged by the Group Director of the examining group where the application is, or may be, pending.

If the protest involves an application to which the protestor has access, e.g., a reissue application filed after March 1, 1977, or one in which protestor has been formally granted access, then protestor may monitor the proceedings and file such additional papers as protestor considers appropriate. If protestor has access to the application, protestor may request the Office to supply protestor with copies of Office actions or other documents mailed by the Office. Such a request should be directed to the particular area in which the application is pending, e.g., Office of Assistant Commissioner for Patents, or Director of the particular examining group. The request should explain why protestor needs the copies in question and should indicate an intent on protestor's part to assist the Office in its examination by supplying relevant comments. Normally, the Office will send copies of Office actions to protestors where the protestor indicates an intent to review actions and, if appropriate, comment to the Office on them. However, since protestor has no right to copies of the Office actions or other documents, the granting or denying of such requests will be within the sole discretion of, and for the convenience of, the Office.

*If the protestor has access to the application,* the examiner may communicate with the protestor *in writing* to seek clarification and/or additional information if the examiner considers such clarification and/or additional information necessary to properly consider the protest. The following suggested format can be used by the examiner to seek clarification and/or additional information from a protestor having access to an application:

> "The protest, as filed_____, has been noted. However, clarification and/or additional information is desired. In particular [Examiner explains] any submission of the requested information should be made with ONE MONTH of the date of this letter and the submission must indicate service on applicant."

While the examiner should not normally need clarification and/or additional information from the protestor where the grounds involve only published prior art, e.g., patents, periodicals, etc., under some circumstances it may be necessary for the examiner to seek such clarification and/or additional information. For example, if the date of a reference is in question, or some question of public use is involved, and the information being sought is within the knowledge or control of the protestor, the examiner may find it necessary to communicate with the protestor to obtain the same.

Where the examiner feels that a protestor with access to an application can contribute significantly to the examination process, the protestor may be given a specific period, normally one month, within which to comment on responses submitted by patent applicants to Office actions. Such a comment period should only be provided where it would appear to be of benefit to the examination process and only with the approval of a Supervisory Primary Examiner. Where an applicant agrees to such participation by a protestor or where a Court has suspended litigation for consideration of a related application by the Patent and Trademark Office with an expression of its desire for such protestor participation, it should be more liberally granted.

Where a protestor requests permission to participate in any interview between an applicant and the examiner or requests on its own behalf to have an interview with the examiner, the request should be referred to the Office of the Assistant Commissioner for Patents for action. Normally, protestor participation in interviews with examiners will not be allowed unless special justifying circumstances exist. Where authorized, participation by the protestor in an interview will be according to conditions set down by the Patent and Trademark Office. Normally, any transcript of the interview, if authorized, will be at the expense of the party or parties requesting it and will be arranged by such party or parties. Where Office actions are being sent to a protestor or where a protestor is present for an interview, a copy of the Interview Summary Form and other records made of the interview will be provided to the protestor. Where protestor's participate in an interview, they may submit their own record of the interview which will be made of record in the file.

Interviews relating to a patent application with a protestor will not be permitted without the applicant present.

A protestor with access to an application appealed to the Board of Appeals who intends to file comments or a brief in opposition to appellant's brief should file an indication of such intention within one month after the notice of appeal is filed and serve a copy of the same upon appellant. The indication of intention should state that protestor agrees to file such comments or brief in triplicate, within one month after appellant's brief is filed, and also agrees to serve a copy of the comments or brief upon appellant. If such an indication is not filed and served, or the protestor's comments or brief is not timely filed in triplicate and served, no assurance is given that the Examiner will consider the protestor's comments or brief during the preparation of the Examiner's Answer.

A protestor who participates by the filing of comments or a brief in opposition to appellant's brief may also request, at the time of filing the comments or brief, to appear at any oral hearing. If a protestor does not file such comments or brief, the protestor cannot be present at any oral hearing. If a protestor does file such a request, the Board of Appeals, in its discretion, will decide whether or not the issues on appeal are such that protestor's participation at the hearing would be helpful. The Board of Appeals will notify protestor whether or not the request to appear at the hearing is granted and, if granted, how much time will be permitted. Of course, if appellant does not request an oral hearing, or provides timely notification to the Board and protestor that appellant will not appear, protestor will not be heard.

A copy of any examiner's letter or communication to a protestor will be mailed to applicant at the same time it is mailed to the protestor. While the examiner may communicate *in writing* with a protestor having access to the application, the examiner will *not* communicate orally and protestor must refrain from oral communications with the examiner except

to ask purely procedural questions which have no relation to the substance of the protest or the merits of the application, unless specifically authorized *in writing* by the Assistant Commissioner for Patents.

Where the handling of a protest or the handling of a reissue application involved in related litigation requires an inordinately larger than normal amount of work on the part of an examiner and where otherwise warranted, Supervisory Primary Examiners may authorize the use of non-examining time for handling some or all of the examination.

The above guidelines are intended to make clearer the policies of the Patent and Trademark Office in respect to the handling of reissue applications, protests and "fraud" questions. The Office is especially interested in seeing that the consideration of reissue applications and protests is thorough and fair. It is interested in seeing that protestors have an opportunity to participate in the proceedings in the Office to the extent that such participation is helpful and appropriate in each case. It is also greatly interested in the completeness and accuracy of the file record, including indications whether or not prior art references and information mentioned in the record have been reviewed by the examiner.

The present guidelines which will be incorporated into the M.P.E.P. as soon as possible, when considered in conjunction with those previously issued and the M.P.E.P., should answer many of the questions being raised about the revised rules.

DONALD W. BANNER,
*Commissioner of Patents & Trademarks.*

Nov. 13, 1978.

## REISSUE APPLICATIONS FILED

**Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).**

**4,004,339,** Re. S.N. 940,520, Filed Aug. 7, 1978, Cl. 24/243.56, SINGLE PISTON OPERATED CLIP DEVICE, Clyde R. Velarde, et al., Owner of Record: *Rheem Manufacturing Company, New York, N.Y.,* Attorney or Agent: George B. Newitt, et al., Ex. Gp.: 323

**4,070,393,** Re. S.N. 945,358, Filed Sep. 25, 1978, Cl. 260/465 C, AMMOXIDATION PROCESS, Howard P. Angstadt, et al., Owner of Record: *Sun Ventures, Inc., Radnor, Pa.,* Attorney or Agent: J. Edward Hess, et al., Ex. Gp.: 124

**4,096,870,** Re. S.N. 948,660, Filed Oct. 5, 1978, Cl. 134/28, METHOD FOR CLEANING SOFT HYDROPHILIC GEL CONTACT LENSES, John A. Manfuso, Jr., Owner of Record: *Burton, Parsons and Company, Inc., Washington, D.C.,* Attorney or Agent: Morris Fidelman, et al., Ex. Gp.: 173

# PATENT NOTICES

## Certificates of Correction for the Week of Dec. 12, 1978

| | | | |
|---|---|---|---|
| Re. 29,663 | 4,066,474 | 4,091,080 | 4,096,395 |
| 3,784,219 | 4,066,911 | 4,091,134 | 4,097,895 |
| 3,862,296 | 4,067,938 | 4,091,399 | 4,112,731 |
| 3,969,700 | 4,069,330 | 4,092,339 | 4,112,916 |
| 3,991,785 | 4,070,368 | 4,093,037 | 4,113,041 |
| 4,000,160 | 4,076,708 | 4,093,546 | 4,113,630 |
| 4,001,142 | 4,080,878 | 4,093,669 | 4,113,753 |
| 4,025,032 | 4,084,248 | 4,093,844 | 4,113,777 |
| 4,025,737 | 4,085,249 | 4,094,104 | 4,113,906 |
| 4,029,380 | 4,087,326 | 4,094,231 | 4,114,072 |
| 4,032,554 | 4,087,903 | 4,094,251 | 4,114,841 |
| 4,033,706 | 4,088,872 | 4,094,566 | 4,115,414 |
| 4,038,067 | 4,088,879 | 4,094,756 | 4,115,466 |
| 4,041,310 | 4,089,390 | 4,094,840 | 4,115,500 |
| 4,045,312 | 4,089,402 | 4,094,961 | 4,115,844 |
| 4,057,461 | 4,089,795 | 4,095,037 | 4,116,060 |
| 4,059,405 | 4,090,038 | 4,095,090 | 4,116,215 |
| 4,060,528 | 4,090,247 | 4,095,232 | 4,116,536 |
| 4,063,803 | 4,090,851 | 4,095,480 | 4,116,640 |
| 4,064,132 | 4,091,006 | 4,095,767 | |
| 4,065,435 | 4,091,007 | 4,095,779 | |

## Adverse Decisions in Interferences

In the designated interferences involving the indicated claims of the following patents, final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,421,205, L. J. Pollock, FABRICATION OF STRUCTURES FOR SEMICONDUCTOR INTEGRATED CIRCUITS, Interference No. 99,831, decided Aug. 11, 1978, claims 1 and 3.

Patent No. 3,632,538, O. S. Kauder, ORGANOTIN STABILIZER COMPOSITION CONTAINING MORE THAN 20% TIN AND RESIN COMPOSITIONS CONTAINING THE SAME, Interference No. 98,846, decided May 30, 1978, claims 1–5 and 7–12.

Patent No. 3,672,922, R. E. Brouillard, L. J. Coughlin and V. L. Winfrey, BENZYL STARCH EMULSION COATING COMPOSITIONS, Interference No. 99,596, decided Sept. 25, 1978, claims 1, 2 and 4.

Patent No. 3,673,140, J. F. Ackerman, J. Weisfeld, R. G. Savageau and G. Beerli, ACTINIC RADIATION CURING COMPOSITIONS AND METHOD OF COATING AND PRINTING USING SAME, Interference No. 98,883, decided June 29, 1978, claims 8, 10, 11, and 20–23.

Patent No. 3,673,140, J. F. Ackerman, J. Weisfeld, R. G. Savageau and G. Beerli, ACTINIC RADIATION CURING COMPOSITIONS AND METHOD OF COATING AND PRINTING USING SAME, Interference No. 99,011, decided June 29, 1978, claim 9.

Patent No. 3,673,140, J. F. Ackerman, J. Weisfeld, R. G. Savageau and G. Beerli, ACTINIC RADIATION CURING COMPOSITIONS AND METHOD OF COATING AND PRINTING USING SAME, Interference No. 98,927, decided June 29, 1978, claim 19.

Patent No. 3,898,410, P. H. Peters, Jr., AC to RF CONVERTER CIRCUIT FOR INDUCTION COOKING UNIT, Interference No. 99,304, decided July 13, 1978, claims 42 and 43.

Patent No. 3,803,449, L. J. Schmersal, METHOD AND APPARATUS FOR MANIPULATING DISCRETE DISCHARGE IN A MULTIPLE DISCHARGE GASEOUS DISCHARGE PANEL, Interference No. 99,228, decided June 8, 1978, claims 1–3, 5, 18 and 20–23.

Patent No. 3,816,324, L. W. Fine, M. Grayson & V. S. Grayson, BLEACHING COMPOSITIONS CONTAINING A N-ACYL AZOLE, Interference No. 99,549, decided Sept. 26, 1978, claims 12 and 13.

Patent No. 3,821,815, C. D. Abbott, G. W. Brock, N. L. Robinson, F. B. Shelledy and S. H. Smith, APPARATUS FOR BATCH-FABRICATING MAGNETIC FILM HEADS AND

Patent No. 3,832,815, J. K. Balaz, R. A. Kelly and W. Schulze, MODULAR INSULATION OF FIBROUS MATERIAL, Interference No. 99,749, decided Aug. 14, 1978, claim 1.

Patent No. 3,842,297, B. J. Pleiss, Jr. and T. J. Surmacz, RECEPTACLE FOR SECURING A SENSING ELEMENT WITHIN ELECTRICAL WINDINGS, Interference No. 99,322, decided Sept. 1, 1978, claim 36.

Patent No. 3,846,779, J. G. Martner, ULTRASONIC TRANSDUCER, Interference No. 99,067, decided Mar. 28, 1977, claim 3.

Patent No. 3,951,912, P. V. Susi, HYDROXYBENZYLPHOSPHONATE ANTIOXIDANTS, Interference No. 99,616, decided Aug. 10, 1978, claims 1, 2 and 4–9.

Patent No. 3,963,629, J. H. McLaughlin, FABRIC SOFTENER COMPOSITION FOR USE IN A CLOTHES DRYER AND METHOD, Interference No. 99,536, decided Oct. 19, 1978, claims 1 and 4.

Patent No. 3,983,226, D. B. Nazzer and V. R. Thayer, GAS STRIPPING AND RECIRCULATION PROCESS IN HEAVY 22, 1978, claims 6, 8 and 9.
WATER SEPARATION PLANT, Interference No. 99,844, deMETHOD THEREFOR, Interference No. 98,999, decided May cided Aug. 10, 1978, claims 1–6.

## National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

*Notice of Availability for Licensing*

The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of the patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of the patent applications can be purchased from the National Technical Information Service (NTIS), Springfield, Va., 22161 for $4.00 ($8.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
*Patent Program Coordinator,*
*National Technical Information Service.*

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, 1900 Half St. SW., Washington, D.C. 20314

Patent 4,079,594. Fusible Heat Sink for a Cryogenic Refrigerator. Filed Jan. 12, 1977. Patented Mar. 21, 1978. Not available NTIS.

Patent application 875,664. Partial Swirl Augmentor for a Turbofan Engine. Filed Feb. 6, 1978.

Patent application 882,526. Centrifugal Aerosol Dispenser Assembly. Filed Mar. 1, 1978.

Patent application 898,067. Digital Hysteresis Circuit. Filed Apr. 20, 1978.

Patent application 900,949. Obturating Split Disc. Filed Apr. 28, 1978.

Patent application 900,950. Ribbed Flange Modified Seal. Filed Apr. 28, 1978.

Patent application 902,130. Frequency Selective Ferrimagnetic Power Limiter. Filed May 2, 1978.

Patent application 902,131. Canted Spar With Intermediate Intercostal Stiffeners. Filed May 2, 1978.

Patent application 902,132. Window Protection From Electron Magnetic Pulse Energy. Filed May 2, 1978.

U.S. DEPARTMENT OF AGRICULTURE

Research Agreements and Patent Branch, General Service Division, Federal Building, Agricultural Research Service Hyattsville, Md. 20782

Patent application 911,080. Method and Apparatus for Watering Bees. Filed May 31, 1978.

Patent application 918,892. Alkyd Resins Modified With Tetrafluoroethylene Adduct of Conjugated Triglycerides. Filed June 26, 1978.

Patent 4,089,746. Method for Insolubilizing Enzymes on Chitosan. Filed July 19, 1976. Patented May 16, 1978. Not available NTIS.

U.S. DEPARTMENT OF COMMERCE

National Technical Information Service, 5285 Port Royal Rd. Springfield, Va. 22161

Patent application 848,176. Scanning Electron Microscope Micrometer Scale and Method for Fabricating Same. Filed Nov. 3, 1977.

U.S. DEPARTMENT OF ENERGY

Assistant General Counsel for Patents Washington, D.C. 20545

Patent application 760,303. Temperature Sensing Device. Filed Jan. 18, 1977.

Patent 4,001,683. Automatic Range Selector. Filed Apr. 25, 1975. Patented Jan. 4, 1977. Not available NTIS.

Patent 4,008,399. Gamma Compensated, Self Powered Neutron Detector. Filed June 13, 1975. Patented Feb. 15, 1977. Not available NTIS.

Patent 4,052,999. Bumper Wall for Plasma Device. Filed July 15, 1975. Patented Oct. 11, 1977. Not available NTIS.

Patent 4,053,355. Nuclear Reactor Remote Disconnect Control Rod Coupling Indicator. Filed Oct. 14, 1975. Patented Oct. 11, 1977. Not available NTIS.

Patent 4,053,358. Modular Assembly for Supporting, Straining, and Directing Flow to a Core in a Nuclear Reactor. Filed Dec. 30, 1974. Patented Oct. 11, 1977. Not available NTIS.

Patent 4,053,359. Nuclear Reactor. Filed Mar. 17, 1976. Patented Oct. 11, 1977. Not available NTIS.

Patent 4,056,052. Method for Shearing Spent Nuclear Fuel Assemblies. Filed Apr. 29, 1976. Patented Nov. 1, 1977. Not available NTIS.

Patent 4,061,921. Infrared Laser System. Filed May 2, 1974. Patented Dec. 6, 1977. Not available NTIS.

Patent 4,062,515. Compact Gate Valve. Filed May 13, 1976. Patented Dec. 13, 1977. Not available NTIS.

Patent 4,063,190. $CO_2$ Laser. Filed Dec. 30, 1975. Patented Dec. 13, 1977. Not available NTIS.

Patent 4,064,029. Method of Making an Improved Superconducting Quantum Interference Device. Filed Feb. 8, 1977. Patented Dec. 20, 1977. Not available NTIS.

Patent 4,065,217. Nose Tip Locking Device. Filed Nov. 24, 1976. Patented Dec. 27, 1977. Not available NTIS.

Patent 4,065,351. Particle Beam Injection System. Filed Mar. 25, 1976. Patented Dec. 27, 1977. Not available NTIS.

Patent 4,065,400. Nuclear Waste Solidification. Filed Apr. 8, 1976. Patented Dec. 27, 1977. Not available NTIS.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

National Institutes of Health, Chief, Patent Branch Westwood Building, Bethesda, Md. 20014

Patent 4,080,325. Synthesis of Methotrexate. Filed Nov. 17, 1976. Patented Mar. 21, 1978. Not available NTIS.

Patent 4,081,356. Fecalator, an Apparatus and Method for Concentration of Parasite Eggs and Larvae. Filed Sept. 24, 1976. Patented Mar. 28, 1978. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research—Code 302, Arlington, Va. 22217

Patent application 875,831. Radar Signal Simulator. Filed Feb. 7, 1978.

Patent application 877,545. Mine Simulator Planting Rack and Release Mechanism. Filed Feb. 13, 1978.

Patent application 877,546. Underwater Search Coil. Filed Feb. 13, 1978.

Patent application 877,547. Flare Release System. Filed Feb. 13, 1978.

Patent application 890,872. Iron-Doped Indium Phosphide Semiconductor Laser. Filed Mar. 27, 1978.

Patent application 890,873. Explosively Actuated Opening Switch. Filed Mar. 27, 1978.

Patent application 892,580. Charge-Coupled Multiplying Digital-to-Analog Converter. Filed Apr. 3, 1978.

Patent application 896,075. Tapered Velocity Electro-Optical Waveguide Switch. Filed Apr. 13, 1978.

Patent application 896,946. Method and Apparatus for Injecting Gas Into a Laser Cavity. Filed Apr. 17, 1978.

Patent application 897,995. High Precision Optical Alignment System. Filed Apr. 20, 1978.

Patent application 901,163. Degraining, a Three Step Process To Obtain Propellant Samples From Case Bonded Motors. Filed Apr. 28, 1978.

Patent 4,084,172. Highly Electronegative ($SN_x$) Contacts to Semiconductors. Filed June 10, 1977. Patented Apr. 11, 1978. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters, NASA—Code GP-2, Washington, D.C. 20546

N7827,984–1. NASA Patent Abstracts Bibliography: A Continuing Bibliography. Supplement 12 Section 2: Indexes. Jan. 1978.

---

INTELLECTUAL PROPERTY DIVISION, OTJAG DEPARTMENT OF THE ARMY

Room 2D 444, Pentagon, Washington, D.C. 20314

Patent 3,573,755. Electrical Tablet for Graphic Input System. Filed Feb. 16, 1968. Patented Apr. 6, 1971.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters, NASA—Code GP–2, Washington, D.C. 20546

Patent 3,999,886. Hingeless Helicopter Rotor With Improved Stability. Patented Dec. 28, 1976.

Patent 4,000,682. Solid Propellant Rocket Motor and Method of Making Same. Patented Jan. 4, 1977.

Patent 4,001,552. Method and Apparatus for Measuring Web Material Wound on a Reel. Patented Jan. 4, 1977.

Patent 4,001,602. Electronic Analog Divider. Patented Jan. 4, 1977.

Patent 4,003,004. Frequency Modulated Oscillator. Patented Jan. 11, 1977.

Patent 4,003,084. Method of and Means for Testing a Tape Record/Playback System. Patented Jan. 11, 1977.

Patent 4,005,574. Reverse Pitch Fan With Divided Splitter. Patented Feb. 1, 1977.

---

U.S. DEPARTMENT OF THE AIR FORCE

AF/JACP, Washington, D.C. 20314

Patent 3,984,839. Low Height VLF Antenna System. Filed May 15, 1975. Patented Oct. 5, 1976.

Patent 3,984,980. Integral Heater Thermal Energy Storage Device. Filed Aug. 5, 1975. Patented Oct. 12, 1976.

Patent 3,985,398. Fluidic Antiskid Circuit. Filed Apr. 8, 1975. Patented Oct. 12, 1976.

Patent 3,985,420. Mechanical Step Scanner. Filed Oct. 10, 1975. Patented Oct. 12, 1976.

Patent 3,985,579. Rib and Channel Vertical Multijunction Solar Cell. Filed Nov. 26, 1975. Patented Oct. 12, 1976.

Patent 3,986,0[illegible]. Universal Temperature Controlled Reference Junction. Filed Feb. 14, 1975. Patented Oct. 12, 1976

Patent 3,986,127. Integrated Feedback Active Filter/Integrator. Filed May 27, 1975. Patented Oct. 12, 1976.

Patent 3,986,129. Generation of Submicrosecond Pulses in a Long Laser. Filed July 25, 1972. Patented Oct. 12, 1976.

Patent 3,986,138. Isothermal Gas Dynamic Laser Nozzle. Filed Mar. 29, 1974. Patented Oct. 12, 1976.

Patent 3,986,139. Radioactively Preionized Electrical Discharged Laser. Filed Feb. 18, 1975. Patented Oct. 12, 1976.

Patent 3,986,241. In-Place Bearing Staking Device. Filed Nov. 18, 1975. Patented Oct. 19, 1976.

Patent 3,986,683. Jet Tab Steerable Missile. Filed Mar. 27, 1974. Patented Oct. 19, 1976.

Patent 3,986,690. Laser Defense and Countermeasure System for Aircraft. Filed Oct. 28, 1975. Patented Oct. 19, 1976.

Patent 3,987,016. Method for the Preparation of Polyarylene Sulfides Containing Pendant Cyano Groups by Polymerizing M-Benzenedithio, Dibromobenzene, and 2,4-Dichlorobenzonitrile. Filed Jan. 16, 1975. Patented Oct. 19, 1976.

Patent 3,987,288. Time Multiplexing Hybrid Sample Data Filter. Filed Apr. 22, 1975. Patented Oct. 19, 1976.

Patent 3,987,453. Balanced Exciter for Wideband Antenna Element. Filed Aug. 18, 1975. Patented Oct. 19, 1976.

U.S. DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research Code 302, Arlington, Va. 22217

Patent 3,970,791. Voice Controlled Disappearing Audio Delay Line. Filed May 27, 1975. Patented July 20, 1976.

Patent 3,978,444. Seafloor Mapping System. Filed May 30, 1975. Patented Aug. 31, 1976.

Patent 3,978,483. Stable Base Band Adaptive Loop. Filed Dec. 26, 1974. Patented Aug. 31, 1976.

Patent 3,980,395. Liquid Crystal Switch for Optical Waveguide. Filed Dec. 2, 1974. Patented Sept. 14, 1976.

Patent 3,981,561. Optically Activated Exciplax Shutter/Attenuator. Filed Oct. 16, 1975. Patented Sept. 21, 1976.

Patent 3,986,003. Multi Position Solid State Touch Switch. Filed Mar. 21, 1975. Patented Oct. 12, 1976.

Patent 3,986,111. Inverted Voltage Gerdien Condenser. Filed Dec. 24, 1974. Patented Oct. 12, 1976.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters, NASA—Code GP–2, Washington, D.C. 20546

Patent 3,984,730. Method and Apparatus for Neutralizing Potentials Induced on Spacecraft Surfaces. Patented Oct. 5, 1976.

---

INTELLECTUAL PROPERTY DIVISION, OTJAG
Department of the Army, Pentagon Room 2D 444 Washington, D.C. 20314

Patent 3,293,158. Anodic Spark Reaction Processes and Articles. Filed Sept. 17, 1963. Patented Dec. 20, 1966.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, 1900 Half St., SW., Washington, D.C. 20324

Patent 4,001,034. High Temperature Coatings Based on Poly (Zinc Phosphinated). Filed Oct. 31, 1975. Patented Jan. 4, 1977.

Patent 4,001,268. Substituted Phenyl-Benzimidazo Compounds. Filed July 18, 1975. Patented Jan. 4, 1977.

Patent 4,001,475. Ablative Surface Insulator. Filed May 9, 1974. Patented Jan. 4, 1977.

Patent 4,001,681. Vector Voltmeter. Filed Jan. 28, 1976. Patented Jan. 4, 1977.

Patent 4,001,767. Low Diffraction Loss-Low Spurious Response $LiTaO_3$ Substrate for Surface Acoustic Wave Devices. Filed Nov. 18, 1975. Patented Jan. 4, 1977.

Patent 4,001,829. High Average Power Millimeter Duplexer. Filed Aug. 18, 1975. Patented Jan. 4, 1977.

Patent 4,002,679. Preparation of Polybenzimidazoles. Filed Mar. 27, 1975. Patented Jan. 11, 1977.

Patent 4,004,342. Fabricated of Ion Implanted P-N Junction Devices. Filed Feb. 23, 1976. Patented Jan. 25, 1977.

Patent 4,004,667. Overload Clutch With Zero Parasitic Torque. Filed Sept. 24, 1974. Patented Jan. 25, 1977.

Patent 4,005,142. Fluorocarbon Ether Bis(O-Aminophenol) Compounds. Filed Sept. 4, 1975. Patented Jan. 25, 1977.

U.S. DEPARTMENT OF ENERGY
Assistant General Counsel for Patents
Washington, D.C. 20545

Patent 3,952,246. Plasma Digital Density Determining Device. Filed May 29, 1975. Patented Apr. 20, 1976.

---

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, Washington, D.C. 20314

Patent 3,968,748. Target Discriminating Bomblet. Filed Jan. 15, 1973. Patented July 13, 1976.

Patent 3,998,088. Testing Apparatus for Incremental Shaft Encoder. Filed Nov. 12, 1975. Patented Dec. 21, 1976.

Patent 3,998,393. Supersonic Diffuser. Filed Jan. 20, 1976. Patented Dec. 21, 1976.

Patent 3,999,865. Method and Apparatus for Determining the Mechanism Responsible for Laser-Induced Damage. Filed Dec. 9, 1974. Patented Dec. 28, 1976.

Patent 4,000,477. Recirculation or Stirred Reactor Flow Laser. Filed Feb. 13, 1974. Patented Dec. 28, 1976.

U.S. DEPARTMENT OF AGRICULTURE
Research Agreements and Patent Branch, General Services Division, Federal Building, Agricultural Research Service Hyattsville, Md. 20782

Patent 4,001,032. Method of Making Nongelling Aqueous Cationic Dialdehyde Starch Compositions. Filed Aug. 13, 1975. Patented Jan. 4, 1977.

Patent 4,003,135. Specimen Holder and Technique Employed to Effect a Continuous Maximum Concentration Gradient in Critical Point Drying. Filed June 13, 1975. Patented Jan. 18, 1977.

Patent 4,005,040. Foamed and Solid Rubber-Starch Graft Copolymer Compositions and Method of Preparation. Filed Nov. 10, 1975. Patented Jan. 25, 1977.

Patent 4,005,556. Lightweight Truss-Framed House. Filed Sept. 19, 1975. Patented Feb. 1, 1977.

Patent 4,009,324. Photodegradable Polyolefin Composition Containing an N-Halo Lactam. Filed Apr. 2, 1976. Patented Feb. 22, 1977.

Patent 4,011,726. Delta Culvert. Filed Nov. 5, 1975. Patented Mar. 15, 1977.

U.S. DEPARTMENT OF TRANSPORTATION
Patent Counsel, 400 7th St. SW, Washington, D.C. 20590

Patent 4,000,564. Programmable Anthropomorphic Articulation. Filed Jan. 7, 1976. Patented Jan. 4, 1977.

U.S. DEPARTMENT OF ENERGY
Assistant General Counsel for Patents
Washington, D.C. 20545

Patent 3,953,617. Method of Producing Encapsulated Thermonuclear Fuel Particles. Filed Jan. 28, 1974. Patented Apr. 27, 1976.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
National Institutes of Health, Chief, Patent Branch
Westwood Building, Bethesda, Md. 20014

Patent 3,990,434. Reversible Intravasal Occlusive Device. Filed Feb. 18, 1975. Patented Nov. 9, 1976.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research, Code 302, Arlington, Va. 22217

Patent 3,891,960. Doppler Sonar System. Filed Feb. 24, 1970. Patented June 24, 1975.

Patent 3,901,075. Acoustic Velocimeter for Ocean Bottom Coring Apparatus. Filed Jan. 10, 1974. Patented Aug. 26, 1975.

Patent 3,933,042. Water Level Gauge. Filed Apr. 5, 1974. Patented Jan. 20, 1976.

Patent 3,962,485. Method for Forming Uniform Stress-Free Thin Films. Filed Oct. 20, 1975. Patented June 8, 1976.

Patent 3,976,369. Alpha Meter Attachment for Underwater Optical Systems. Filed Sept. 27, 1975. Patented Aug. 24, 1976.

Patent 3,978,334. Precision Laser Beam Deflection Detector. Filed Sept. 24, 1975. Patented Aug. 31, 1976.

Patent 3,978,813. Propeller-Driven Hydrophone Array Tensioning Device. Filed Jan. 9, 1976. Patented Sept. 7, 1976.

Patent 3,981,258. Waterski Sailboat. Filed July 15, 1975. Patented Sept. 21, 1976.

Patent 3,982,222. Deep Hydrophone String. Filed Oct. 22, 1965. Patented Sept. 21, 1976.

Patent 3,985,080. Two Selector Gate for Active-Passive Radio Proximity Fuzes. Filed Oct. 30, 1967. Patented Oct. 12, 1976.

Patent 3,986,115. Transient Direction Detector. Filed Jan. 20, 1975. Patented Oct. 12, 1976.

Patent 3,986,159. Air Dropped Sonobuoy. Filed Sept. 2, 1975. Patented Oct. 12, 1976.

Patent 3,987,708. Depth Insensitive Accumulator for Undersea Hydraulic Systems. Filed Mar. 10, 1975. Patented Oct. 26, 1976.

Patent 3,990,123. Inflatable Sonar Array. Filed Sept. 22, 1975. Patented Nov. 9, 1976.

Patent 3,990,386. Faired Multi-Strength Member Towcable and Associated Sequential Load Distribution System. Filed May 22, 1975. Patented Nov. 9, 1976.

Patent 3,992,628. Countermeasure System for Laser Radiation. Filed July 17, 1972. Patented Nov. 16, 1976.

Patent 3,996,794. Differential Depth Indicator. Filed Oct. 17, 1966. Patented Dec. 14, 1976.

Patent 4,000,022. Fast-Burning Compositions of Fluorinated Polymers and Metal Powders. Filed Oct. 17, 1974. Patented Dec. 28, 1976.

Patent 4,001,291. 2,2,2-Fluorodinitroethanethiol and Method of Preparation. Filed Mar. 11, 1976. Patented Jan. 4, 1977.

Patent 4,003,083. Digital Data Recording and Decoding. Filed Apr. 15, 1975. Patented Jan. 11, 1977.

Patent 4,003,291. Missile Launching Mine. Filed May 20, 1964. Patented Jan. 18, 1977.

Patent 4,003,641. Low Distortion High Energy Laser Mirror. Filed July 25, 1975. Patented Jan. 18, 1977.

Patent 4,003,876. Super Cooled M-Phenylene Diamine as a Curing Agent for Epoxy Resins. Filed July 25, 1975. Patented Jan. 18, 1977.

---

U.S. DEPARTMENT OF ENERGY
Assistant General Counsel for Patents
Washington, D.C. 20545

Patent 3,948,735. Concentration and Purification of Plutonium or Thorium. Filed June 1, 1973. Patented Apr. 6, 1976.

Patent 3,949,050. Method of Absorbing $UF_6$ From Gaseous Mixtures in Alkamine Absorbents. Filed Sept. 20, 1948. Patented Apr. 6, 1976.

Patent 3,951,573. Fluid Lubricated Bearing Construction. Filed July 16, 1946. Patented Apr. 20, 1976.

Patent 3,955,753. Gas Centrifuge With Driving Motor. Filed Apr. 13, 1961. Patented May 11, 1976.

Patent 3,957,577. Hydraulic Control Rod. Filed June 23, 1955. Patented May 18, 1976.

Patent 3,957,945. Chemical Isolation of Exp. 82 Sr. From Protor-Irradiated Mo Targets. Filed Aug. 21, 1974. Patented May 18, 1976.

Patent 3,957,956. Closed Cycle Ion Exchange Method for Regenerating Acids, Bases, and Salts. Filed June 20, 1974. Patented May 18, 1976.

Patent 3,958,699. Charging Machine. Filed July 13, 1954. Patented May 25, 1976.

Patent 3,959,069. Method of Preparing Gas Tags for Identification of Single and Multiple Failures of Nuclear Reactor Fuel Assemblies. Filed June 5, 1974. Patented May 25, 1976.

Patent 3,959,070. Method of Operating a Neutronic Reactor. Filed Nov. 18, 1952. Patented May 25, 1976.

Patent 3,959,455. Labeling of Indocyanine Green With Carrier-Free Iodine-123. Filed July 1, 1975. Patented May 25, 1976.

Patent 3,962,114. Method for Solidifying Liquid Radioactive Wastes. Filed Apr. 11, 1975. Patented June 8, 1976.

Patent 3,963,936. Neutronic Reactor Thermal Shield. Filed Mar. 14, 1955. Patented June 15, 1976.

Patent 3,964,967. Tag Gas Capsule With Magnetic Piercing Device. Filed Feb. 24, 1975. Patented June 22, 1976.

U.S. DEPARTMENT OF THE INTERIOR
Branch of Patents, 18th and C Sts. NW.
Washington, D.C. 20240

Patent 3,981,962. Decomposition Leach of Sulfide Ores With Chlorine and Oxygen. Filed June 30, 1975. Patented Sept. 21, 1976.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters, NASA—
Code GP–2, Washington, D.C. 20546

Patent 3,994,128. Dual Output Variable Pitch Turbofan Actuation System. Patented Nov. 30, 1976.

Patent 3,995,476. Miniature Biaxial Strain Transducer. Patented Dec. 7, 1976.

Patent 3,995,644. Percutaneous Connector Device. Patented Dec. 7, 1976.

Patent 3,995,789. Reel Safety Brake. Patented Dec. 7, 1976.

Patent 3,995,877. Fifth Wheel. Patented Dec. 7, 1976.

Patent 3,996,064. Electrically Rechargeable Redox Flow Cell. Patented Dec. 7, 1976.

Patent 3,996,070. Thermocouple Installation. Patented Dec. 7, 1976.

Patent 3,996,464. Mass Spectrometer With Magnetic Pole Pieces Providing the Magnetic Fields for Both the Magnetic Sector and an Ion-Type Vacuum Pump. Patented Dec. 7, 1976.

Patent 3,996,468. Electron Microscope Aperture System. Patented Dec. 7, 1976.

## Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

| *State* | *Name of Library* | *Telephone Contact* |
|---|---|---|
| Alabama | Birmingham Public Library | (205) 254-2555 |
| California | Los Angeles Public Library | (213) 626-7555 Ext. 274 |
| | Sunnyvale Patent Library* | (408) 736-0795 |
| Colorado | Denver Public Library | (303) 573-5152 Ext. 223 |
| Georgia | Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology | (404) 894-4519 |
| Illinois | Chicago Public Library | (312) 269-2814 |
| Massachusetts | Boston Public Library | (617) 536-5400 Ext. 265 |
| Michigan | Detroit Public Library | (313) 833-1458 |
| Missouri | Kansas City: Linda Hall Library | (816) 363-4600 |
| | St. Louis Public Library | (314) 241-2288 Ext. 214 |
| Nebraska | Lincoln: University of Nebraska-Lincoln, Love Library | (404) 472-3411 |
| New Jersey | Newark Public Library | (201) 733-7740 |
| New York | Albany: New York State Library | (518) 474-5125 |
| | Buffalo and Erie County Public Library | (716) 856-7525 Ext. 267 |
| | New York Public Library (The Research Libraries) | (212) 790-6291 |
| North Carolina | Raleigh: D. H. Hill Library, N.C. State University | (919) 737-3280 |
| Ohio | Cincinnati & Hamilton County Public Library | (513) 369-6969 |
| | Cleveland Public Library | (216) 623-2932 |
| | Columbus: Ohio State University Libraries | (614) 422-6286 |
| | Toledo/Lucas County Public Library | (419) 242-7361 Ext. 258 |
| Oklahoma | Stillwater: Oklahoma State University Library | (405) 624-6546 |
| Pennsylvania | Philadelphia: Franklin Institute Library | (215) 448-1226 |
| | Pittsburgh: Carnegie Library of Pittsburgh | (412) 622-3128 |
| Rhode Island | Providence Public Library | (401) 521-7722 Ext. 224 |
| Texas | Dallas Public Library | (214) 748-9071 |
| | Houston: The Fondren Library, Rice University | (713) 527-8101 Ext. 2587 |
| Washington | Seattle: Engineering Library, University of Washington | (206) 543-0740 |
| Wisconsin | Madison: Kurt F. Wendt Engineering Library, University of Wisconsin | (608) 262-6845 |
| | Milwaukee Public Library | (414) 278-3043 |

*Collection organized by subject matter.

# PATENT EXAMINING CORPS

**RENE D. TEGTMEYER, Assistant Commissioner**

**WILLIAM FELDMAN, Deputy Assistant Commissioner**

## CONDITION OF PATENT APPLICATIONS AS OF NOVEMBER 4, 1978

| PATENT EXAMINING GROUPS | Actual Filing Date of Oldest New Case Awaiting Action |
|---|---|
| **CHEMICAL EXAMINING GROUPS** | |
| GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices. | 12-19-77 |
| GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides. | 12-16-77 |
| HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes. | 5-1-78 |
| COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography. | 9-29-77 |
| SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes: Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes. | 10-4-77 |
| **ELECTRICAL EXAMINING GROUPS** | |
| INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales. | 5-16-77 |
| SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material. | 5-23-77 |
| INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts. | 11-22-77 |
| RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating. | 5-01-78 |
| ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring. | 2-17-77 |
| DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts. | 1-14-77 |
| **MECHANICAL EXAMINING GROUPS** | |
| HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment. | 10-3-77 |
| MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks. | 1-16-78 |
| AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination. | 7-28-77 |
| HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication. | 10-31-77 |
| GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors: Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines. | 8-24-77 |

**Expiration of patents:** The patents within the range of numbers indicated below expire during November 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 82nd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,007,169 to 3,001,168, inclusive
Plant Patents..... Numbers 2,101 to 2,107, inclusive

# REISSUES

## DECEMBER 12, 1978

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

**Re. 29,860**

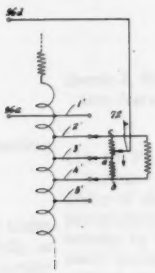
**ROTARY POTENTIOMETER WITH SPEED REDUCTION GEARING**

**Larkin B. Scott, Fort Worth, Tex., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.**

**Original No. 3,129,382, dated Apr. 14, 1964, Ser. No. 847,958, Oct. 22, 1959. Application for reissue Oct. 28, 1977, Ser. No. 846,630**

**Int. Cl.[2] G05F *1/14***

**U.S. Cl. 323—43.5 R** **8 Claims**



**1.** In electrical apparatus having a series of terminals, one of which is a reference terminal, means for maintaining a reference voltage on the reference terminal and voltages of predetermined values relative to the reference voltage on the respective other terminals along the series, means for deriving voltages intermediate those on the terminals including a continuous electrical path in the form of a closed loop of distributed impedance subdivided into sections by taps at at least three substantially equally spaced points thereon, switching means for connecting pairs of adjacent taps in rotation across successive pairs of adjacent terminals along the series, and a contact movable along that section of the impedance loop between the taps on said section connected to a first and second terminal, the improvement comprising switching means having at least three first conductive elements; each connected to one of said taps, a plurality of second conductive elements, each connected to one of said terminals, said first and second [terminals] *conductive elements* comprising at least a portion of the surface of a substantially cylindrical drum; and electrical bridging means movable to interconnect each of said first conductive elements with one of said second conductive elements.

# PLANT PATENTS

## GRANTED DECEMBER 12, 1978

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

### 4,342
### KALANCHOE PLANT NAMED TOLTEC

**Claude Hope, Cartago, Costa Rica, assignor to Pan-American Plant Company, West Chicago, Ill.**

**Filed Feb. 9, 1978, Ser. No. 876,429**
**Int. Cl.[2] A01H *5/00***
**U.S. Cl. Plt.—68** **1 Claim**

1. A new and distinct cultivar of kalanchoe substantially as herein shown and described, characterized by the intense red coloring of its flowers, its continuous production of flowers over an extended period, and its attractive pot-size growth habit.

---

### 4,343
### KALANCHOE PLANT NAMED GODDESS

**Claude Hope, Cartago, Costa Rica, assignor to Pan-American Plant Company, West Chicago, Ill.**

**Filed Feb. 9, 1978, Ser. No. 876,428**
**Int. Cl.[2] A01H *5/00***
**U.S. Cl. Plt.—68** **1 Claim**

1. A new and distinct kalanchoe cultivar, substantially as herein shown and described, characterized by its upright growth of medium height, its substantially uniform 10-week flowering response under photoperiod control, and its continuous and showy production of rose pink flowers over an extended blooming period.

---

### 4,344
### KALANCHOE NAMED MONTEZUMA

**Claude Hope, Cartago, Costa Rica, assignor to Pan-American Plant Company, West Chicago, Ill.**

**Filed Feb. 9, 1978, Ser. No. 876,461**
**Int. Cl.[2] A01H *5/00***
**U.S. Cl. Plt.—68** **1 Claim**

1. A new and distinct variety of kalanchoe plant, substantially as herein shown and described, characterized by its abundant display of intense orange colored florets appearing on stems of medium height extending from a base of relatively large, glossy green foliage.

### 4,345
### KALANCHOE NAMED TABASCO

**Claude Hope, Cartago, Costa Rica, assignor to Pan-American Plant Company, West Chicago, Ill.**

**Filed Feb. 9, 1978, Ser. No. 876,462**
**Int. Cl.[2] A01H *5/00***
**U.S. Cl. Plt.—68** **1 Claim**

1. A new and distinctive cultivar of kalanchoe, substantially as herein shown and described, characterized by its upright growth displaying relatively large clusters of intense orange-red flowers of medium size and its base cover of relatively large glossy foliage.

---

### 4,346
### CHRYSANTHEMUM PLANT

**Barrie J. Machin, Littlehampton, England, assignor to Framptons Nurseries Limited, Chichester, England**

**Filed Jun. 13, 1977, Ser. No. 806,012**
**Int. Cl.[2] A01H *5/00***
**U.S. Cl. Plt.—80** **1 Claim**

1. A new and distinct variety of *Chrysanthemum morifolium Bailey* of the pink open terminal spray type, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of improved color, especially during high light and temperature periods, a strong uniform spray, a longer growing season, and flowers less prone to bruising and damping than the pink open spray type chrysanthemums heretofore known.

---

### 4,347
### NON-TOXIC STRAIN OF *FUSARIUM GRAMINEARUM*

**Gerald L. Solomons, High Wycombe, and Gerald W. Scammell, Chinnor, both of England, assignors to Ranks Hovis McDougall Limited, London, England**

**Continuation of Ser. No. 417,190, Jan. 7, 1974, abandoned, which is a continuation of Ser. No. 140,303, May 4, 1971, abandoned. This application Dec. 19, 1975, Ser. No. 642,610**
**Claims priority, application United Kingdom, May 14, 1970, 23452/70; Jun. 24, 1970, 30584/70**
**Int. Cl.[2] A01H *15/00***
**U.S. Cl. Plt.—89** **1 Claim**

1. A novel non-toxic fungi *Fusarium graminearum* as shown and described in the foregoing specification and drawings which has been deposited with the Commonwealth Mycological Institute and identified as *Fusarium graminearum* Schwabe I.M.I. 145425.

# PLANT PATENTS

## GRANTED DECEMBER 12, 1972

# PATENTS

## GRANTED DEC. 12, 1978

### ERRATA

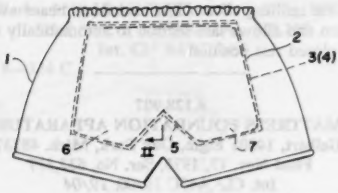
| For CLASS | See PATENT NO. |
|---|---|
| 264–046.6 | 4,128,963 |
| 405–031 | 4,129,006 |
| 405–261 | 4,129,007 |
| 405–303 | 4,129,008 |
| 405–227 | 4,129,009 |
| 405–169 | 4,129,010 |
| 405–169 | 4,129,011 |
| 073–329 | 4,129,024 |
| 093–033 R | 4,129,032 |
| 280–628 | 4,129,245 |
| 404–046 | 4,129,396 |
| 422–098 | 4,129,418 |
| 422–064 | 4,129,419 |
| 195–100 | 4,129,483 |
| 528–168 | 4,129,529 |
| 521–079 | 4,129,530 |
| 521–094 | 4,129,531 |
| 526–075 | 4,129,532 |
| 521–117 | 4,129,533 |
| 521–038 | 4,129,534 |
| 528–048 | 4,129,554 |
| 528–097 | 4,129,556 |
| 526–283 | 4,129,557 |
| 528–337 | 4,129,559 |
| 546–142 | 4,129,565 |
| 546–326 | 4,129,566 |
| 546–121 | 4,129,567 |
| 528–128 | 4,129,570 |
| 562–549 | 4,129,592 |
| 562–557 | 4,129,593 |
| 568–593 | 4,129,601 |
| 423–235 | 4,129,651 |
| 260–823 | 4,129,700 |
| 526–017 | 4,129,721 |

# PATENTS

## GRANTED DECEMBER 12, 1978

## GENERAL AND MECHANICAL

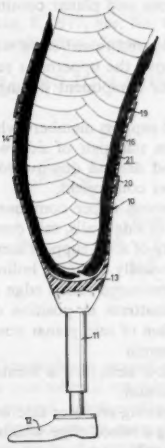
**4,128,902**
**PROTECTIVE GYMNAST PANTS**
**Gary R. Siebert, Wyomissing, Pa., assignor to Gym-Kin Inc., Sinking Spring, Pa.**
**Filed Aug. 9, 1977, Ser. No. 823,190**
**Int. Cl.[2] A41D *13/00***
**U.S. Cl. 2—2** **2 Claims**




1. A pair of gymnast pants having a pouch atttached to the inside of the front portion of the pants and having a perimeter encompassing only the pelvic, hip and thigh area of the gymnast, and padding means comprising a plurality of flexible, elastic foam cushions enclosed in said pouch for protecting the gymnast against injury while learning wrapping skills on uneven parallel bars or the like, said pouch including a flap wrapped around the top ends of said cushions for insuring their retention in the pouch while allowing ready withdrawal and reinsertion of selected cushions in said pouch.

---

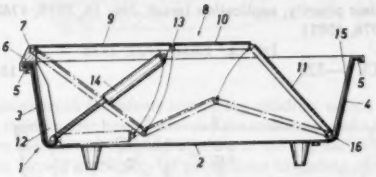
**4,128,903**
**TEMPORARY WALKING AID FOR USE AFTER LOWER LEG AMPUTATIONS**
**Gunnar Marsh, Karlskrona; Ole Henrikssen, Asarum, and Urban C. S. Sjoblum, Karlskrona, all of Sweden, assignors to Landstingens Inkopscentral Lic, Ekonomisk Forening, Solna, Sweden**
**Filed Apr. 26, 1977, Ser. No. 790,910**
**Claims priority, application Sweden, Apr. 28, 1976, 7604885**
**Int. Cl.[2] A61F *1/02, 1/08***
**U.S. Cl. 3—19** **4 Claims**



1. A prosthesis for an amputated lower leg comprising an upper part attachable to the remaining lower leg stump and a supporting cushion structure, this upper part being attached to an under part provided with an artificial foot, characterized in that the upper part has a cup-shaped bottom portion which at a number of places along its circumference merges into upwardly directed flexible strips of such lengths that, when the leg stump is placed between them, they extend up along the leg stump and thigh, the bottom portion and stips forming a holder adapted to fit, with an approximately predetermined and relatively large play, around the bandaged leg stump itself so that this play can be filled with said supporting structure around the leg stump, said structure taking the form of an envelope or cushion containing a large number of small plastic balls, said cushion being airtight but connectable to the surrounding atmosphere by a closeable hose or the like whereby the cushion, formless in an air-filled condition, can be placed around the leg stump and thigh, and formed to fit in the holder before the cushion is evacuated to form a relatively rigid shell, whereafter it is intended to clamp fast the flexible strips against the rigid shell by at least one tension band which is tightened around the strips, at least in the area about the thigh.

---

**4,128,904**
**BATH EQUIPMENT FOR DISABLED PERSONS**
**Lars Ekman, Helsingborg, Sweden, and Helge Norman, Lagvagen 41, (Ytterby) Kungalv, Sweden (442 00), assignors to Helge Norman, Kungalv, Sweden**
**Filed May 31, 1977, Ser. No. 802,190**
**Claims priority, application Sweden, Feb. 26, 1976, 7602439; Nov. 26, 1976, 7613258**
**Int. Cl.[2] A47K *3/12***
**U.S. Cl. 4—185 L** **8 Claims**




1. In combination a bath tub and a device for lowering a patient into and lifting a patient out of said bath tub, said device comprising a bath plate having two ends, one of said ends being pivotally fixed to one end of said bath tub; a wire secured to the opposite end of said bath plate; and means for tensioning and slackening said wire operatively connected to said wire whereby said bath plate can be lowered in and lifted out of said bath tub.

---

**4,128,905**
**BASIN RECEPTACLE**
**Larry W. Mathes, R.R. 5, Box 11, Corydon, Ind. 47112**
**Filed Jun. 29, 1977, Ser. No. 810,915**
**Int. Cl.[2] A47C *19/00***
**U.S. Cl. 4—187 R** **17 Claims**

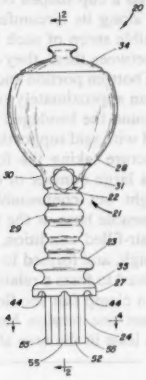
1. A receptacle for routing fluid from a faucet to a drain opening which comprises:

a body portion having a passageway therethrough, said body portion includes an open bowl member and integral therewith a flexible neck section;

a flange portion joined to said body portion at one end of said passageway, said flange portion including a first hollow region extending therethrough and communicating with said passageway, said neck section extending between the flange and the bowl member;

anchoring means joined to said flange and including a sec-

ond hollow region extending through said anchoring means and communicating with said first hollow region, said anchoring means being insertable into said drain opening for securing said receptacle in an upright position between said faucet and said drain opening; and



said flange sealingly engageable around said drain opening when said anchoring means are fully inserted into said drain opening.

---

**4,128,906**

## TOILET-BOWL FLUSH SYSTEM AND DEVICES THEREFOR

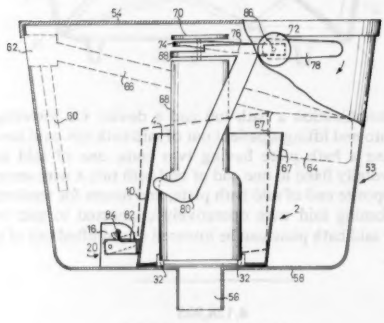
**Zeev Raz, 17 Keren Hayessod Str., Be'er-Sheva, Israel**

**Continuation-in-part of Ser. No. 689,055, May 24, 1976, abandoned. This application Jul. 5, 1977, Ser. No. 812,519**

**Claims priority, application Israel, Jun. 15, 1975, 47481; Feb. 10, 1976, 49011**

**Int. Cl.² E03D *1/22, 1/36***

**U.S. Cl. 4—325** **16 Claims**



1. A device for converting a single volume cistern into a selective volume cistern adapted to selectively allow both low-volume and high-volume flushes wherein said single volume cistern is of the type having a water inlet, a water outlet, a water level responsive means for controlling the amount of water flowing into the cistern including a valve mechanism operationally linked thereto, a flush actuating means and a flushing mechanism operationally linked to said water outlet, said device comprising a hollow vessel provided with an opening at its upper end for the entry of water therethrough and being adapted to be inserted into the flushing cistern in a first normally closed rest position which surrounds the flushing mechanism and forms an open ended water column extending above and around said water outlet to exclude a portion of the water in said cistern from passing through said water outlet while said vessel is in said first position for low volume flushes, and wherein at least a section of the upwardly extending surface area of said vessel is adapted to be tilted and pivotally displaced from said first rest position to a second displaced open-position to form a multidirectional opening for the rapid passage of water under the lower edge of said tiltable section, and a water level responsive float means which in movement ascribes an arc; a portion of said tiltable section in its displaced position intersecting the arc ascribed by said water level responsive float means and being engaged by said float means in its downward arc upon the emptying of the cistern and being retained in said displaced position during the entire flushing section and until the completion thereof whereafter the rising water in the refilling cistern lifts said float means away from said section and allows said section to automatically return to its initial closed rest position.

---

**4,128,907**

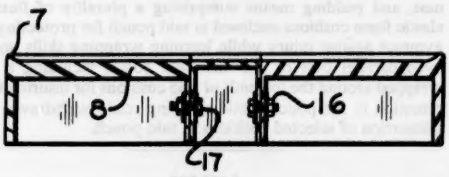
## MATTRESS FOUNDATION APPARATUS

**Bernard Gelbart, 14301 Elgin, Oak Park, Mich. 48237**

**Filed Nov. 17, 1975, Ser. No. 632,377**

**Int. Cl.² A47C *19/00, 19/04***

**U.S. Cl. 5—200 R** **4 Claims**



1. A structure, including, in combination, a mattress, and comprising:

a planar continuous upper component;

a pair of end walls which are unitary with and depend downwardly from said planar continuous upper component;

a pair of side walls which are unitary with and depend downwardly from said planar continuous upper component;

a continuous contoured raised edge which is unitary with and projects above the uppermost surface of said planar continuous upper component sloping upwardly and outwardly;

a plurality of solid support members which are unitary with and extend from said pair of side walls, and which are unitary with and depend downwardly from said planar continuous upper component;

said planar continuous upper component, said pair of end walls, said pair of side walls, said continuous raised edge, and said plurality of solid support members comprising an inelastic, downwardly opening, hollow structure;

said continuous contoured raised edge constitutes a rim for retaining said mattress in position on and against said uppermost surface of said planar continuous upper component; and wherein

said inelastic hollow structure is formed by a first section and a second section;

said first section having an outer side wall and an inner side wall, and having a raised edge which terminates adjacent said inner side wall;

said second section having an outer side wall and an inner side wall and having its raised inner edge terminate adjacent its inner side wall;

said inner side walls of said first and second sections being

provided with mating apertures therethrough to accommodate the passage therethrough of fastening means for interconnecting said inner side walls of said first and second sections;

said raised edges of said first and second sections being so oriented and aligned when said first and second sections are assembled together that there is formed a continuous raised edge about the upper periphery of said planar continuous upper component.

---

**4,128,908**

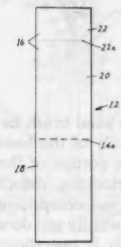
## SLEEPING BAG LINER

**Reuben Kerbs, 1460 Laurel St., Coos Bay, Oreg. 97420**

**Filed Nov. 7, 1977, Ser. No. 849,307**

**Int. Cl.[2] A47G *9/00***

**U.S. Cl. 5—334 C** **3 Claims**




1. A sheet liner for a sleeping bag or the like comprising

an elongate sheet folded crosswise to form top and bottom panels joined at their lower ends by a fold, said bottom panel having a greater length than said top panel, and

seams joining said top and bottom panels along their opposite side edges, said seams extending from said fold along a major portion of said side edges, but terminating short of the upper edge of said top panel.

---

**4,128,909**

## ROLLER FOR CLEANING PHONOGRAPH RECORDS

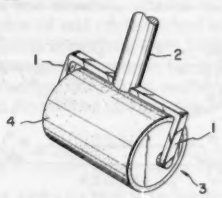
**Hirokazu Kawabe, Tokyo; Kiyoshi Imai, and Masanobu Miyakoshi, both of Annaka, all of Japan, assignors to Nagaoka Co. Ltd. and Shin-Etsu Chemical Co., Ltd., both of Tokyo, Japan**

**Filed Aug. 5, 1977, Ser. No. 822,276**

**Claims priority, application Japan, Aug. 11, 1976, 51-107162[U]**

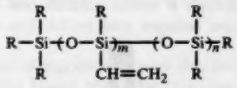
**Int. Cl.[2] C08G *77/04;* G11B *3/58***

**U.S. Cl. 15—104 A** **4 Claims**




1. An improved Gramophone record cleaner of the roller type wherein at least one roller is rotatably supported by and between a pair of opposed, substantially parallel limbs on a handled bracket, the improvement comprising the roller having an outermost layer made of a rubbery organopolysiloxane elastomer having hardness not exceeding 40 as determined in accordance with Japanese Industrial Standard K 6301, the surface of the layer being sticky, the stickiness of the surface of the layer is in the range of 4 to 30 as determined by J. Dow's rolling ball stick test, and said rubbery organopolysiloxane elastomer has a formulation comprising:

(a) a diorganopolysiloxane with a viscosity in the range from 100 to 500,000 centistokes at 25° C. represented by the general formula



where R is a monovalent hydrocarbon group free of aliphatic unsaturation, such as methyl and phenyl groups and m and n are each positive integers with the proviso that m/(m+n) is between 0.001 and 0.1,

(b) an organopolysiloxane with a viscosity not exceeding 10,000 centistokes at 25° C., having 1.5 to 3 hydrogen atoms bonded directly to the silicon atoms per molecule, in an amount such that from 0.01 to 1.0 of the hydrogen atoms bonded directly to the silicon atoms are provided per vinyl group in component (a), and

(c) a catalytic amount of a platinum compound.

---

**4,128,910**

## TOOTHBRUSH

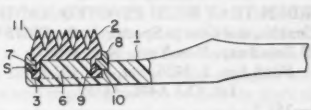
**Yuichi Nakata, Chigasaki, and Tadayoshi Murakami, Tokyo, both of Japan, assignors to Pigeon Kabushiki Kaisha, Tokyo, Japan**

**Filed May 4, 1977, Ser. No. 793,804**

**Claims priority, application Japan, Jul. 7, 1976, 51-89908[U]**

**Int. Cl.[2] A47L *13/14***

**U.S. Cl. 15—110** **3 Claims**




1. A toothbrush for infants and young children, which comprises a rigid handle having one end for attachment of a brush structure thereto and defining a recess to the one end, a brush structure having a plurality of projections extending substantially parallel to one another, made of a soft resilient rubber-like material and attached to one end of the handle with the projections projecting therefrom, and a rigid frame member fixedly located in the recess and defining an opening supporting the periphery of brush structure adjacent the one end of the handle to an extent to provide a desired restraint against bending of the projections, thereby to provide the brush structure with a desired stiffness wherein said brush structure has an anchoring part, and a core groove formed internally of the anchoring part, and said handle is formed on a surface at the forward end thereof with a groove for receiving the anchoring part and a core projection to be inserted into the core groove in the brush structure.

---

**4,128,911**

## COMPOUND MANUAL TOOTHBRUSH

**Africa P. Perez, 199 McAllister Rd., Downsview, Toronto, Ontario, Canada (M3H 2P1)**

**Filed Jun. 14, 1977, Ser. No. 806,554**

**Claims priority, application Canada, Jul. 9, 1976, 256724**

**Int. Cl.[2] A46B *9/04***

**U.S. Cl. 15—167 R** **2 Claims**

1. A compound toothbrush comprising first and second toothbrushes, said first and second toothbrushes each having a bristled head portion and a handle portion, the second toothbrush in its entire length, or substantial portion thereof, being adapted to fit in a groove in the first toothbrush in readily assemblable and disassemblable relationship for conjunct or

separate use, said groove in the first toothbrush longitudinally extending within the bristled side of its head and handle portion, the length, width and depth of the groove corresponding to the length, width and thickness of the second toothbrush, or to that of its portion adapted to fit in the groove, such that said first and second toothbrushes firmly hold together when assembled, the brush head portion of the second toothbrush being narrow both in shape and bristling pattern such as it may be suitable to users for brushing under the gum line, the brush head portions of the first and second toothbrushes forming a single compound brush head portion when assembled for conjunct use.

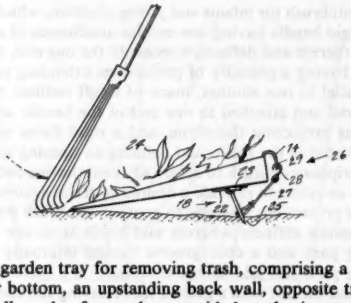
---

**4,128,912**

## GARDEN TRAY WITH PIVOTED HANDLE

**Harold E. Conklin, and George Spector, both of 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007**

**Filed Jun. 2, 1976, Ser. No. 691,998**
**Int. Cl.² A47L *13/52***
**U.S. Cl. 15—257.7** **2 Claims**



1. A garden tray for removing trash, comprising a flat rectangular bottom, an upstanding back wall, opposite triangular side walls and a front edge provided at the juncture of the bottom and side walls, in combination with a handle pivotally mounted on the bottom wall exterior adapted to support the tray against the ground, said handle including spaced rotatable shafts parallel to the edge, said shafts provided with stops perpendicular to each shaft at one end and a U-shaped extending integrally at right angles from the other end of said shafts and disposed generally transversely relative to the stops, said handle including spaced spurs extending from said bail in a direction remote from said tray, said stops being disposed generally transversely relative to said spurs, whereby rotation of the shafts through a predetermined angle will cause the stops to bear against the bottom of the tray when the spurs and handle are disposed generally transversely to the tray bottom, thereby causing the spurs to transmit external downward pressure and pierce the supporting ground, a tab integral with an upper edge of said back wall rearwardly bent parallel and spaced from said back wall, an opening through said tab, and a strap unit affixed to said W-shaped bail detachably secured to said tab opening.

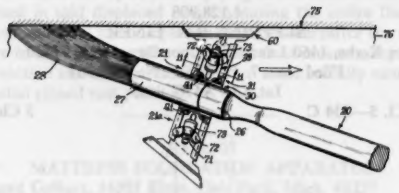
---

**4,128,913**

## TRIM GUIDE

**Albert S. Scholl, 2706 S. Redvale Ave., Chicago, Ill. 60623**

**Filed Nov. 3, 1977, Ser. No. 848,270**
**Int. Cl.² A46B *17/00*; B44D *3/22***
**U.S. Cl. 15—246** **9 Claims**



1. A trim guide for a paint brush having bristles extending substantially longitudinally of the handle comprising: attachment means on the base portion of the brush; support means having means for interlocking, detachable connection with said attachment means and comprising an elongated portion extending angularly outwardly and downwardly from the base portion when the brush is operationally positioned over a surface to be painted; and detachable guide means at the outer end of said elongated portion including a planar guide surface disposed in preselected angular intersecting bias relation to the lengthwise axis of said elongated portion for operationally engaging an underlying support at positions remotely in advance of the brush bristles as the same are drawn over a surface to be painted; said guide means serving to maintain the brush in predetermined operating position with the bristles thereof in preselected contact with the surface to be painted.

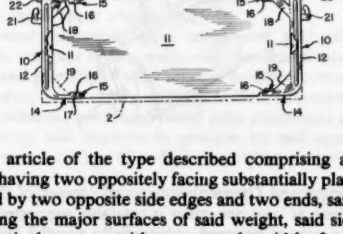
---

**4,128,914**

## WEIGHT AND WEIGHT END PIECE FOR VERTICAL SLAT BLIND

**Hendrik de Wit, Rotterdam, Netherlands, assignor to Hunter Douglas International N.V., Curacao, Netherlands Antilles**

**Filed Mar. 29, 1977, Ser. No. 782,315**
**Claims priority, application Fed. Rep. of Germany, Mar. 31, 1976, 2613749**
**Int. Cl.² E05F *7/00***
**U.S. Cl. 16—1 R** **9 Claims**



1. An article of the type described comprising a weight element having two oppositely facing substantially planar sides bordered by two opposite side edges and two ends, said planar sides being the major surfaces of said weight, said side edges being relatively narrow with respect to the width of said planar sides, at least one end piece, said end piece being generally "U" shaped, said end piece being dimensioned such that the arms of said "U" fit over and embrace the opposite side edges of said weight with said major surfaces extending between said arms, the arms of said "U" being resiliently springable apart, a catch element on each of said arms of said "U", a second catch

element on each of the opposite side edges of said weight, said end piece when in position with its arms embracing said weight having the catch elements of its arms engaged with the catch elements of said weight for retaining said end piece in position on the end of said weight.

---

**4,128,915**

## MACHINE FOR THE SHAPING OF MEAT DISHES

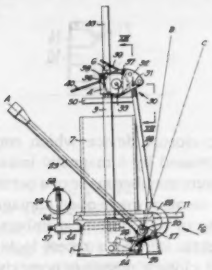
**Victor Brusselle, De Smet deNaeyerlaan 16, 8370 Blankenberge, Belgium**

**Filed Dec. 9, 1976, Ser. No. 749,043**

**Claims priority, application Belgium, Dec. 23, 1975, 254732; Nov. 9, 1976, 255431**

**Int. Cl.[2] A22C *7/00***

**U.S. Cl. 17—32** **6 Claims**



1. Machine for shaping meat dishes, including a supply container for meat, a displaceable mold plate disposed below said container and having a mold opening therein, a control lever mounted on a first axle, first means for displacing said mold plate, second means for pushing a quantity of meat from said container into said mold opening and assure a proper filling thereof, and third means for pushing said quantity of meat out of said mold opening, said first, second and third means being coupled to said control lever, said first means comprising a first toothed rack connected to said mold plate and cooperating with a sector gear linked via a first lever arrangement with said axle, said second means comprising a vertical second toothed rack provided at one end with a disc forming a piston slidable in said container, the other end of said second rack cooperating with a gear wheel mounted on a horizontal axle, a ratchet wheel and a first lever fixed on one end of said horizontal axle, said ratchet wheel cooperating with a fixedly mounted first ratchet and with a second ratchet fixed on said first lever and said first lever being connected with the axle of said control lever by means of a second lever arrangement, and said first ratchet enabling the rotation of said ratchet wheel in one direction, whereas said second ratchet inhibits the rotation of said ratchet wheel in the other direction, said third means comprising a pin located in the path of said first lever arrangement, said pin being fixed on a second lever on which a second axle is fixed, said second axle carrying a pusher element for pushing said quantity of meat out of said mold opening.

---

**4,128,916**

## METHOD AND APPARATUS FOR PROCESSING PORK SIDES

**Edwin O. Fick, Jr., Norfolk, and Edward L. Bell, Madison, both of Nebr., assignors to Madison Foods, Inc., Madison, Nebr.**

**Filed Oct. 25, 1977, Ser. No. 844,845**

**Int. Cl.[2] A22C *17/02***

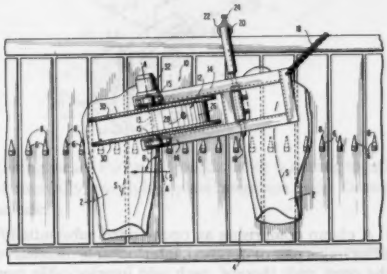
**U.S. Cl. 17—52** **21 Claims**

1. Meat processing apparatus, comprising,

a conveyor means for supporting bodies of meat, said conveyor means being driven in a given direction and having lateral hooks provided with impaling ends,

shifting means positioned above the conveyor in the path of bodies of meat on the conveyor for shifting the bodies of meat into impaled engagement on said hooks, said shifting means having a meat-engaging portion guided for movement in a path which is convergent to said given direction of the conveyor, said path having lateral component opposed to said hooks whereby meat on the conveyor engaged by said shifting means is shifted laterally on the conveyor and driven into impaled engagement on said hooks.

17. A method of processing a pork side including a loin on a conveyor having lateral hooks for retaining the pork side on the conveyor, said method comprising the steps of,



placing the pork side on a conveyor having lateral hooks provided with impaling ends, said pork side overlying said hooks but not penetrated thereby,

moving the conveyor in a forward direction to advance the pork side through an impaling station,

engaging the upper surface of said pork side at said impaling station with a rotary member which has its rotational axis lying at an acute angle to said forward direction,

rotating the rotary member while engaged with said pork side at said impaling station to shift the pork side laterally on the conveyor toward said impaling ends to drive the pork side into impaled engagement on said hooks, and

cutting the pork loin from said side supported on the conveyor and impaled by said hooks.

---

**4,128,917**

## CARDING ENGINES

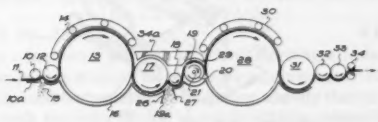
**John M. J. Varga, Halifax, England, assignor to Carding Specialists (Canada) Limited, Toronto, Canada**

**Filed Apr. 29, 1977, Ser. No. 792,145**

**Claims priority, application United Kingdom, May 3, 1976, 17946/76**

**Int. Cl.[2] D01G *15/40***

**U.S. Cl. 19—105** **7 Claims**



1. A duo-card engine comprising a breaker card having a breaker carding cylinder, means for feeding staple fibres to the breaker cylinder, a breaker doffer for doffing a web of fibres from the breaker cylinder, a pair of crush rolls downstream of the breaker doffer, a toothed roller downstream of the pair of crush rolls, rotating at a surface speed sufficient to break up the web substantially into individual fibres and fibre groups and free dirt from the same, a partly shrouded, rotatable, perforated vacuum cage adjacent to and downstream of the toothed roller, on the surface of which the fibres are reassembled, means for feeding the fibres from the cage to the cylinder of a

finisher card, and a finisher doffer for doffing the web from the finisher cylinder.

---

**4,128,918**

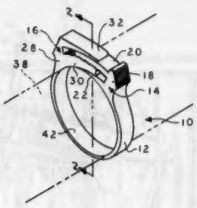
## ADJUSTABLE SNAP-ON-CLAMP

**Raymond C. Wenk, Crystal Lake, Ill., assignor to Matrix IV, Inc., Woodstock, Ill.**

**Continuation-in-part of Ser. No. 745,661, Nov. 29, 1976. This application Nov. 8, 1977, Ser. No. 849,684**

**Int. Cl.[2] F16L *33/00*; A44B *21/00***

**U.S. Cl. 24—16 R** **11 Claims**




1. A clamp comprising an open-ended substantially annular band having a pair of opposed, interlockable members disposed at the open ends thereof; each said interlockable member including a support element and an arcuate jaw and resilient biasing means extending from the support element, each said jaw having a plurality of teeth oriented for interlocking engagement with the teeth of the other jaw and said biasing means developing opposing forces against said jaws to maintain said teeth in engagement when said opposed members are interlocked; each said biasing means comprising a cantilevered tongue tapering from a thick base portion proximate said support element to a flexible extremity; the entire inside surface of said clamp being continuously concave and substantially smooth to develop and distribute substantially uniform circumferential pressure about an object secured within said clamp.

---

**4,128,919**

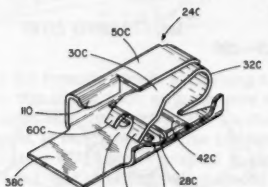
## METAL TIE

**John J. Bulanda, New Lenox; Casimir M. Guzay, Des Plaines, and Bruce A. Betitschke, Oaklawn, all of Ill., assignors to Panduit Corp., Tinley Park, Ill.**

**Filed Sep. 26, 1977, Ser. No. 836,272**

**Int. Cl.[2] B65D *63/02***

**U.S. Cl. 24—20 TT** **24 Claims**




1. A tie for forming a plurality of elongate objects into a bundle and for holding two objects together, said tie comprising:

an elongated strap having a plurality of spaced abutments therealong; and

a metal locking head joined to one end of said strap and comprising a floor having a strap-receiving aperture therethrough and further comprising a locking tongue for engaging one of said abutments, said tongue and floor being joined by a resilient neck with said aperture disposed intermediate said one end of the strap and the junction of said neck and floor, said tongue extending from said neck toward said floor to at least partially overlie said aperture whereby threading of said strap causes said tongue to deflect away from said floor and said tongue lockingly engages one of said abutments upon attempted retrograde movement of said strap.

---

**4,128,920**

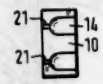
## MAGNETIC CLOSURE DEVICE

**Ludwig Bourguignon, Bernauerstrasse 75, 8210 Prien a. Ch., Fed. Rep. of Germany**

**Division of Ser. No. 616,041, Sep. 23, 1975, abandoned. This application Feb. 11, 1977, Ser. No. 767,736**

**Int. Cl.[2] A44B *21/00***

**U.S. Cl. 24—201 B** **7 Claims**




1. A magnetic closure device which employs a magnetic closing force increased by a magnetic instability force, comprising a first closure member made of a permanent magnet and a second closure member made of an unmagnetized, magnetizable material, one of said closure members having a surface with a shaped recess forming a recess locking means therein, the other of said closure members comprising a plurality of correspondingly shaped fitting locking elements adapted to fit into said shaped recess locking means, and securing means operatively interconnecting said plurality of fitting locking elements to form a row of fitting locking elements, whereby the closure device is adjustable and closable by the engagement of a different one of said fitting locking elements with said recess locking means, whereby said magnetic closing force is increased by said magnetic instability force, wherein one of said closure members comprises two recesses arranged side by side, each recess being open toward two adjacent sides of said one closure member, two notches in said one closure member being arranged to reach into the respective recess from a further adjacent side of said one closure member, and wherein a plurality of shaped fitting locking elements of the other closure member are shaped to fit into said recesses, and means interconnecting said fitting locking elements in spaced relationship relative to each other to form a loop both ends of which are connected to the other closure member whereby portions of said interconnecting means extend through said notches when two locking elements are held in said two recesses.

---

**4,128,921**

## TENSION STRAP WITH MOVABLE TENSION BLOCKS

**Horst Heinze, Krailling; Günter Stierle, Unterhaching, and Ernst D. Sach, Garching, all of Germany, assignors to Messerschmitt-Bölkow-Blohm Gesellschaft mit beschrankter Haftung, Munich, Germany**

**Filed Dec. 2, 1977, Ser. No. 856,976**

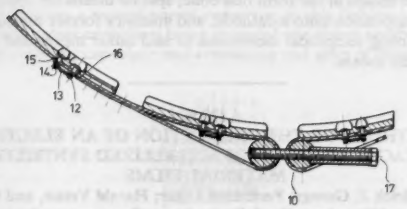
**Claims priority, application Fed. Rep. of Germany, Dec. 9, 1976, 2655772**

**Int. Cl.[2] F16L *33/04***

**U.S. Cl. 24—279** **10 Claims**

1. A tension strap comprising a strap member to be circumferentially positioned about a body to be tensioned, a plurality of longitudinally movable tension blocks carried on the inside circumferential surface of said strap member for engaging said body, and means for maintaining each said tension block in a predetermined position relative to said strap member, said means including at least a first pin extending through each said tension block and said strap member, said pin being fixedly carried in either said tension block or said strap member and

passing through a guideway in the other, and elastic means acting on said pin against longitudinal movement thereof to



predetermine the position of said tension block with respect to said strap member.

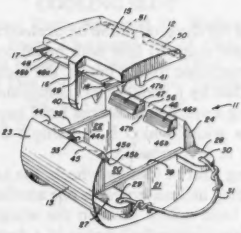
---

**4,128,922**

## SEALING DEVICE

**Charles L. Hutchison, 11 Charleston Rd., Hinsdale, Ill. 60521**

**Filed Aug. 19, 1977, Ser. No. 825,865**
**Int. Cl.[2] B65D *77/10***
**U.S. Cl. 24—30.5 R** **8 Claims**



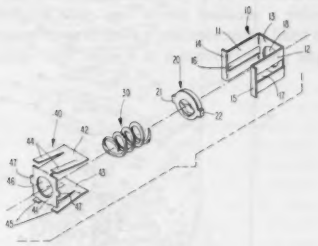
1. A sealing device to close the open end of a bag or casing comprising: a first non-metallic member having a top portion and a rigid downwardly extending central portion; a second non-metallic member containing at least two parallel rigid side walls; means for guiding and receiving said central portion of said first non-metallic member within an opening in said second non-metallic member; said central portion received and positioned within said opening between and parallel to said two rigid walls thereby forming a first sealing means wherein said casing is secured and sealed below said central portion and above said side walls; locking means for permanently attaching said first non-metallic member to said second non-metallic member while securing said casing therebetween wherein said locking means comprises a series of tabs formed on said first non-metallic member and a corresponding series of tabs formed on said second non-metallic member; each of said tabs containing an angled surface and an adjacent outwardly extending horizontal surface; said angled surface of each tab on said first non-metallic member being at the same inclination and abutting the angled surface of a corresponding tab on said second non-metallic member while said first and second non-metallic members are in the process of being secured together; and said first non-metallic member and said second non-metallic member being permanently locked together when the horizontal surface of a tab on said first non-metallic member is trapped behind and abutted against the horizontal surface of a corresponding tab on said second non-metallic member.

**4,128,923**

## SNAP-IN RECEPTACLE ASSEMBLY FOR FASTENER

**Robert H. Bisbing, Springfield, Pa., assignor to Southco, Inc., Concordville, Pa.**

**Filed Nov. 25, 1977, Ser. No. 854,717**
**Int. Cl.[2] A44B *17/00***
**U.S. Cl. 24—221 R** **8 Claims**



1. Fastening means for quickly detachably fastening together a pair of mutually overlying plate members, said fastening means including:

A. a stud;

B. a receptacle assembly, said receptacle assembly comprising:

a. a housing member having two parallel side segments connected by a rearward segment, the free end of each of said side segment having an outwardly bent flange portion;

b. a retainer member having two parallel side segments connected by a forward segment, said side segments having projecting therefrom outwardly extending spring elements; said housing and retainer members being placed in such relative assembled positions as to form a six-sided hollow rectangular prism;

c. stud-engaging means within said prism;

d. a spring member within said prism having its forward end bearing against said forward segment of said retainer member and its rearward end applying thrust against said rearward segment of said housing member for urging said forward and rearward segments of said retainer and housing members away from each other.

---

**4,128,924**

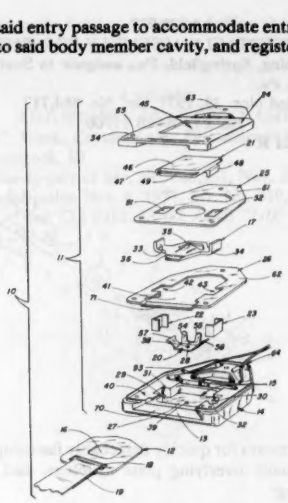
## LAMINATED SEAT BELT BUCKLE

**Hermann E. Happel, and James R. Anthony, both of Indianapolis, Ind., assignors to Indiana Mills & Manufacturing Inc., Carmel, Ind.**

**Continuation-in-part of Ser. No. 685,332, May 11, 1976, abandoned. This application Feb. 17, 1977, Ser. No. 769,722**
**Int. Cl.[2] A44B *11/26***
**U.S. Cl. 24—230 AL** **4 Claims**

1. In a laminated seat belt buckle comprising a main body member having a cavity therein and a cover member adapted to overlie said body member also having a cavity therein registering with the body cavity, movable latching means for engaging a seat belt tongue and manual operating means accessible at the exterior of the cover member for actuating said latching means, the improvement wherein the the line of junction of said body member and cover member lies in a single flat plane except for opposed offset portions at adjacent ends of the members forming an entry passage for a seat belt tongue into said body member cavity, a first reinforcing plate recessed in the marginal area of said body member and a second reinforcing plate recessed in the marginal area of said cover, said reinforcing plates being contiguous along the line of junction of the body and cover members and generally coextensive with said members, the end portion of said first plate being offset

adjacent said entry passage to accommodate entry of a seat belt tongue into said body member cavity, and registering apertures



in said plates accommodating said latching means and said operating means.

---

**4,128,925**

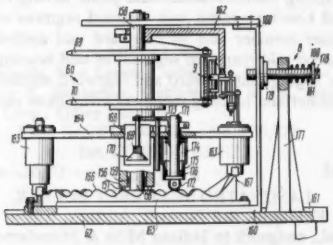
## ARRANGEMENT FOR ASSEMBLING VACUUM TUBE BASES

**Valery F. Chestnov, ulitsa Vasenko, 15, kv. 18, and Mikhail V. Shibanov, ulitsa Michurina, 26, kv. 3, both of Saransk Mordovskoi ASSR, U.S.S.R.**

**Continuation of Ser. No. 559,871, Mar. 19, 1975, abandoned. This application Sep. 8, 1977, Ser. No. 832,429**

**Int. Cl.[2] H01J 9/06, 9/48**

**U.S. Cl. 29—25.2** **6 Claims**



1. An arrangement for assembling vacuum tube bases comprising: continuously moving chain conveyor means, rotors each provided with a respective group of actuating means, each of said actuating means performing a different one of assembling operations comprising moving bases into clamps, shaping of electrodes and bases, flattening end bending of electrode ends, clamping cathode with electrode bent ends, oxidixing of cathodes; clamp means attached to links of said chain conveyor means in a cantilevered manner for receiving, holding and transporting bases from one rotor to another; stationary former means each arranged in proximity to a respective group of actuating means to cooperate therewith and to actuate said actuating means for performing respective assembling operations in the process of interaction with bases; chain conveyor means for discharging assembled bases, said rotors being in the form of sprockets formed by two rigidly interlinked toothed discs and disposed intermediate of fixed upper and lower plates, groups of actuating means each performing one of assembling operations arranged on rotors and interacting with clamp means holding bases and arranged on the chain conveyor means both on the outer side and inside of a sprocket through holes in said discs, actuating means for cathode oxidixing and containing a vessel for a suspension, mixer means in the form of a cone, spatula means for applying the suspension onto a cathode, and auxiliary former means for imparting reciprocal movement to said mixer means and said spatula means.

---

**4,128,926**

## METHOD FOR THE PRODUCTION OF AN ELECTRIC STACK CAPACITOR OF METALLIZED SYNTHETIC MATERIAL FILMS

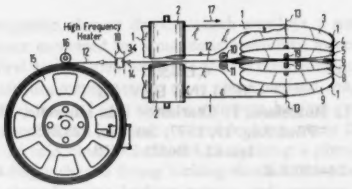
**Friedrich J. Gaenge; Ferdinand Utner; Harald Vetter, and Gerhart Vilsmeier, all of Regensburg, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany**

**Filed Jul. 13, 1977, Ser. No. 815,217**

**Claims priority, application Fed. Rep. of Germany, Jul. 30, 1976, 2634442**

**Int. Cl.[2] H01G 4/30**

**U.S. Cl. 29—25.42** **7 Claims**




1. A method for the production of an electric stack capacitor having synthetic material film with metal coatings forming a stack of superimposed folded layers, the metal coatings being frontal-contacted by a metal layer, comprising the steps of:

(a) providing a synthetic material band having a metal coating and a width which is a multiple of a width of the capacitor to be produced;

(b) providing a set of folding wheels, the axes of the folding wheels being inclined towards one another in such manner that at a band inflow position the wheels are spaced approximately double the amount of a desired folded width from each other and at an outflow position are spaced a slight distance from one another relative to the spacing at the inflow position;

(c) conveying said band to the inflow position of the folding wheels, said band being tangent to the wheels, stretched, and folded by the wheels to create continuous longitudinal folds, said band exiting from the wheels at the outflow position;

(d) hardening the folded band as it is conveyed from the outflow position to form a fold block;

(e) frontal contacting the metal coatings; and

(f) separating the fold block into individual capacitors.

---

**4,128,927**

## METHOD FOR THE PRODUCTION OF A LAYER CAPACITOR

**Georg Dahms, Assenhausen, and Hubert Kraus, Regensburg, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany**

**Filed Aug. 17, 1977, Ser. No. 825,222**

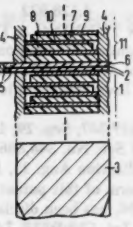
**Claims priority, application Fed. Rep. of Germany, Sep. 24, 1976, 2643087**

**Int. Cl.[2] H01G 4/30**

**U.S. Cl. 29—25.42** **5 Claims**

1. A method for the production of a layer capacitor comprising the steps of: winding sufficient turns of dielectric layers and metal coatings onto a large diameter drum to form a first parent capacitor of a desired number of layers; gluing synthetic material separating layers to the already wound first parent

capacitor, said separating layers projecting beyond the dielectric layers on both sides of the wound first parent capacitor; winding additional dielectric layers and metal coatings onto the separating layers without gluing to the separating layers in order to form a second parent capacitor, in this fashion a plurality of parent capacitors being arranged one above another to form a starting capacitor; end-contacting end sides of the start-



ing capacitor by completely covering them with layers of sprayed metal; grinding off projecting portions of the separating layers projecting beyond the dielectric layers; tempering the starting capacitor; and dividing the starting capacitor into individual parent capacitors along the separating layers and into individual capacitors at right angles to the longitudinal direction of the dielectric layers and coatings.

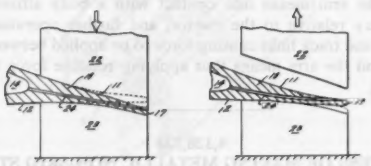
---

**4,128,928**

## METHOD OF FORMING A CURVED TRAILING EDGE COOLING SLOT

**L. D. Shotts, Forest Park; Raymond W. Wisbey, Sharonville, and Albert W. Sears, Cincinnati, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio**

**Filed Dec. 29, 1976, Ser. No. 755,264**
**Int. Cl.[2] B23P** *15/02*
**U.S. Cl. 29—156.8 B** **8 Claims**



1. An improved method of forming a cooling air slot between an internal cavity of a turbomachinery airfoil and the trailing edge thereof, wherein the improvement comprises the steps of:

(a) forming an airfoil to a first shape;

(b) deflecting the trailing edge portion of the airfoil toward the suction side thereof;

(c) forming a straight slot which extends between the internal cavity and a point in the trailing portion of the airfoil; and

(d) forming the airfoil to a final shape by reforming the trailing edge portion thereof toward the pressure side of the airfoil such that said straight slot becomes curved.

---

**4,128,929**

## METHOD OF RESTORING WORN TURBINE COMPONENTS

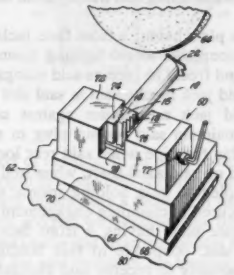
**Ralph T. DeMusis, 547 Foxon Rd., North Branford, Conn. 06471**

**Filed Mar. 15, 1977, Ser. No. 777,674**
**Int. Cl.[2] B23P** *15/02, 13/02*
**U.S. Cl. 29—156.8 B** **17 Claims**

1. The method of restoring turbine blades of the type having an airfoil portion, having a fir tree at one end of the blade and having at the other end of the blade a worn shroud adapted to be engaged by a sealing ring of the turbine, which includes the steps of:

(a) building up that particular edge of the shroud of the worn blade which is disposed opposite to the leading edge of the airfoil portion, by fusing metal to the worn portions of said edge,

(b) mounting the worn blade solely by its fir tree in a fixture which includes a vise, and which includes a reference surface disposed so as to have a predetermined fixed parallel relationship with respect to a corresponding edge of



the shroud of a new blade if the latter is similarly mounted in said fixture,

(c) said step of mounting the worn blade comprising engaging and clamping multiple surfaces of one side of the fir tree with one jaw of said vise and engaging and clamping at least one surface of the opposite side of the fir tree with the other jaw of said vise, and

(d) removing portions of the added metal from the built-up edge of the shroud of the worn blade mounted in said fixture, until said built-up edge essentially attains the said fixed parallel relationship.

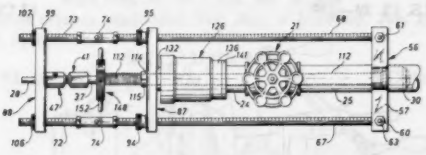
---

**4,128,930**

## PLUMBING TOOL WITH EXTERNAL SHACKLE

**Thomas A. Tomlinson, 348 Manor Rd. East, Toronto 298, Ontario, Canada**

**Division of Ser. No. 270,534, Jul. 10, 1972, abandoned. This application Nov. 19, 1973, Ser. No. 417,131**
**Claims priority, application Canada, Mar. 10, 1972, 136771**
**The portion of the term of this patent subsequent to Feb. 12, 1992, has been disclaimed.**
**Int. Cl. B23p** *19/04;* **F16l** *55/18*
**U.S. Cl. 29—213 R** **25 Claims**



1. A plumbing device which comprises:

an elongated axial shaft having front and rear ends;

a radially outwardly resiliently expansible and axially resiliently compressible sealing plug disposed about said shaft in proximity to said front end thereof, said sealing plug being intended to be disposed within a pipe for sealing engagement with an inner surface of such a pipe;

a plug-abutment member on said axial shaft for axial abutment by said sealing plug forwardly thereof;

a jack mechanism comprising first and second jack members adapted to undergo relative axial separation on relative rotation thereof in a first direction and relative axial move-

ment toward each other on relative rotation in the opposite direction, and disposed on said shaft toward said rear end thereof;

an elongated cylinder surrounding said shaft and extending between said sealing plug and said jack mechanism and adapted to transmit axial movement from said jack mechanism to said sealing plug to cause axial compression and consequently radially outward expansion of said sealing plug on relative rotation of said first and second jack members in said first direction;

a pipe-clamping shackle for clamping engagement with an outer-surface of the pipe;

a holding means extending rearwardly from said pipe-clamping shackle;

a rear lock gate plate having a front face, including an open-ended slot, couplable to aid holding means and adapted removably and freely to receive said elongated shaft rearwardly of said jack mechanism in said slot for axial abutment of said jack mechanism against said front face thereby to maintain said sealing plug in a desired axial position within the pipe when said rear lock gate plate is so positioned on said axial shaft, when said rear lock gate plate is coupled to said holding means and when said shackle is secured in clamping engagement with the pipe;

a front lock gate plate having a front face, including an open-ended slot, couplable to said holding means, and adapted removably to receive said elongated cylinder in said slot therein;

an abutment member adapted to be received in said open-ended slot in said front lock gate plate for axial abutment with said front face of said front lock gate plate; and

a rigid bracing member extending between said abutment member and said sealing plug to maintain said sealing plug in a desired axial position within the pipe when said abutment member is so disposed in said slot in said front lock gate plate, when said front lock gate plate is coupled to said holding means, and when said shackle is secured in clamping engagement with the pipe,

whereby said sealing plug can be held in such a desired axial position within the pipe by either of said front and rear lock gate plates thereby to permit both the removal from and the fitting to the end of the pipe of a plumbing element without risk of axial movement of said sealing plug.

---

**4,128,931**

## TOOL FOR OPENING CABLE FITTINGS

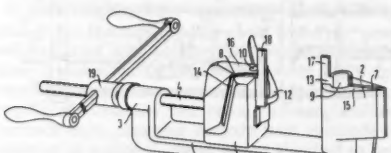
**Josef Bauer, Germering; Herbert Krause, Munich, and Hans-Juergen Meltsch, Germering, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany**

**Filed Jul. 22, 1977, Ser. No. 818,214**

**Claims priority, application Fed. Rep. of Germany, Jul. 29, 1976, 7623935[U]**

**Int. Cl.² B23P *19/04***

**U.S. Cl. 29—239** **12 Claims**



1. A tool for opening cable fittings comprising: a bracket arm, stationary and movable tension jaws at least one of which is a closable clamping jaw, said jaws carried by said bracket arm having top surfaces and a horizontal dimension, an insert member detachably attachable to each of said tension jaws, each insert member provided with a tab means, said tab means projecting beyond a top surface of each of the tension jaws upon attachment of the insert member to its associated tension jaw, the projecting tab means being of smaller horizontal dimension than the jaws and being movable towards and away from one another upon movement of the movable tension jaw towards and away from the stationary tension jaw and being engageable with portions of a cable fitting to force the cable fitting open.

---

**4,128,932**

## METHOD FOR TURNING A TRACK BUSHING

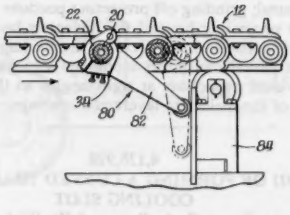
**Harold W. Vanlandingham, Washington; Roger L. Boggs; David A. Bullock, both of East Peoria, all of Ill., and James N. Maytum, Waverly, Iowa, assignors to Caterpillar Tractor Co., Peoria, Ill.**

**Division of Ser. No. 617,347, Sep. 29, 1975, Pat. No. 4,002,090, which is a division of Ser. No. 348,886, Apr. 9, 1973, Pat. No. 3,915,036. This application Aug. 25, 1976, Ser. No. 717,717**

**The portion of the term of this patent subsequent to Sep. 27, 1994, has been disclaimed.**

**Int. Cl.² B23P *7/00***

**U.S. Cl. 29—401 R** **1 Claim**



1. A method of rotating a bushing which is one of a plurality thereof associated with a series of track links, with the bushings being arranged for engagement between teeth of a track driving sprocket of a tractor, comprising providing arm means attached to the bushing, operating the tractor and track links to bring the arm means into contact with a body affixed and stationary relative to the tractor, and further operating the tractor and track links causing force to be applied between the body and the arm means thus applying rotative force to the bushing.

---

**4,128,933**

## PROCESS OF MAKING METALLIC NON-SKID STUDS FOR TIRES

**Jean Walrave, Meylan, France, assignor to Eurotungstene, Grenoble, France**

**Filed Nov. 15, 1977, Ser. No. 851,687**

**Claims priority, application France, Nov. 17, 1976, 76 35288**

**Int. Cl.² B22F *5/00***

**U.S. Cl. 29—420.5** **5 Claims**

1. The method of making metallic studs for vehicle tires wherein the finished stud is composed of a sintered sheath shaped to provide at least one anchoring collar adjacent one end, an intermediate portion of reduced diameter, and a socket portion of predetermined depth at the opposite end within which an insert of hardened material is partially disposed, comprising the steps of:

(1) forming the socketed sintered sheath in a preliminary configuration;
(2) introducing by cold pressing said hardened insert partially into said socket to define an unoccupied zone in said socket not in excess of 0.5 mm in depth between the inserted end of said insert and the base of said socket;
(3) holding the section of said sheath surrounding said insert, and
(4) shaping at least a portion of said unsupported sheath to final form.

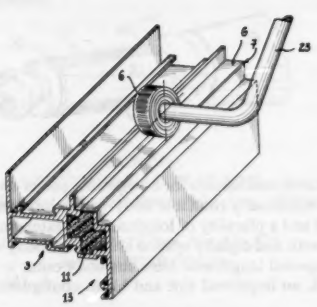
---

**4,128,934**

## METHOD OF MAKING A THERMALLY INSULATED WINDOW FRAME

**Gerhard Doring, Wuppertal-Ronsdorf, Germany, assignor to Firma Julius & August Erbsloh, Wuppertal-Barmen, Germany**

**Division of Ser. No. 393,581, Aug. 31, 1973, abandoned, which is a division of Ser. No. 159,629, Jul. 6, 1971, abandoned. This application May 9, 1975, Ser. No. 576,135**
**Claims priority, application Fed. Rep. of Germany, Jul. 6, 1970, 20 33442**
**Int. Cl.[2] B29D *27/04*; B23P *11/00***
**U.S. Cl. 29—460** **1 Claim**



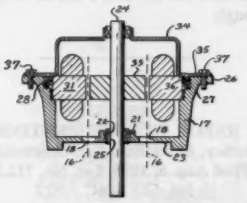

1. A method of making a thermally insulated window frame, comprising the steps of:
forming a frame structure from unitarily hollow extruded metallic members with completely closed internal profiles consisting of oppositely directed dovetail channels on opposite sides of each member, said sides of each member being bridged by two opposite metallic strips unitarily attached to said sides and defining separating grooves therewith;
filling by pouring into the interiors of said members of the respective channels a liquid hardenable foamable thermally insulating material;
foaming said insulating material in the interior of said members against said sides and said strips with pressure;
hardening the insulating material in the interior of each member and the respective channels;
tearing both said strips away from each member to separate the sides thereof from one another and expose respective faces of the hardened material flush with edges of said member, each strip being torn away by rolling it up and thereby peeling it away; and
fitting a sealing strip over one of said faces into said sides along the length of the respective member.

**4,128,935**

## ASSEMBLY METHOD FOR A MOTOR

**James I. Czech, Stevensville, and Ernest B. Ruble, South Haven, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.**

**Filed Jan. 5, 1978, Ser. No. 867,093**
**Int. Cl.[2] H02K *15/00***
**U.S. Cl. 29—596** **8 Claims**




1. The method of assembling an electric motor, comprising:
providing a rigid first end bell; forming a bearing seat in said first end bell; positioning a bearing in said bearing seat;
fixing said first end bell with said bearing therein in a holding fixture; positioning and securing against axial movement a rotor shaft for said motor in the bearing;
placing a plurality of spaced air gap producing shims adjacent the outer diameter of the rotor core;
placing a stator for said motor over and enclosing the shims with the stator resting on said first end bell;
providing a gap between said stator and first end bell;
placing curable epoxy fluid resin in said gap;
placing a second end bell and second bearing held by said second end bell over the end of the rotor shaft that is opposite to said first end bell and with said shaft extending into said second bearing, said second end bell having been previously provided with projecting tabs arranged to enter said gap, said tabs being located adjacent to an outer peripheral edge portion of said second end bell;
forcing said tabs into said epoxy resin and said peripheral portion of said sheet metal stamping in contact with said first end bell;
curing said epoxy resin while retaining the assembly of end bells, rotor, stator and bearings; and
mechanically securing said end bells together.

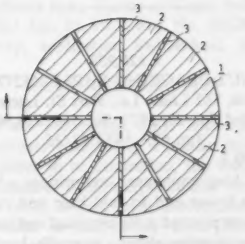
---

**4,128,936**

## METHOD FOR THE MANUFACTURE OF CONTACTS FOR GAS-BLAST CIRCUIT BREAKERS

**Klaus-Peter Rolff, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany**

**Filed May 16, 1977, Ser. No. 797,480**
**Claims priority, application Fed. Rep. of Germany, Jun. 10, 1976, 2626246**
**Int. Cl.[2] H01R *9/00***
**U.S. Cl. 29—630 R** **5 Claims**




1. A method of manufacturing a nozzle-shaped contact, said

contact being used in a pressurized-gas circuit breaker and having slots in its end face and arc-resistant plastic material inserted in said slots, the method comprising:

forming a plurality of contact members, said contact members each having two outer surfaces;

and cementing each outer surface of each of said members to the outer surface of an adjacent member with an arc-resistant plastic material to form a closed body having a bore therethrough.

---

**4,128,937**

## SAFETY RAZOR WITH SERPENTINE HANDLE

**Charles S. Adorney, 61 Mallard Dr., Greenwich, Conn. 06830**

**Filed Aug. 6, 1976, Ser. No. 712,398**

**Int. Cl.[2] B26C *21/22***

**U.S. Cl. 30—47** **7 Claims**

1. A safety razor comprising a handle assembly and a cartridge including at least one blade element mounted on said handle assembly, said handle assembly including an elongated gripping portion which defines one end of the razor and a head connected to said gripping portion and including a surface which extends transversely with respect to the center line of said gripping portion to define the other end of the razor and means for mounting said cartridge so that no part of said cartridge extends beyond said other end and so that the cutting edge of said blade element extends at an acute angle with respect to said transverse surface in a place substantially parallel to said gripping portion and to said transverse surface and its cutting action is in a direction substantially parallel to the center line of said gripping portion, wherein said head has a serpentine-like shape which defines said transverse surface at a first bend, which depends from said first bend to a second bend and which extends from said second bend to said mounting means.

---

**4,128,938**

## NUT-CRACKING IMPLEMENT

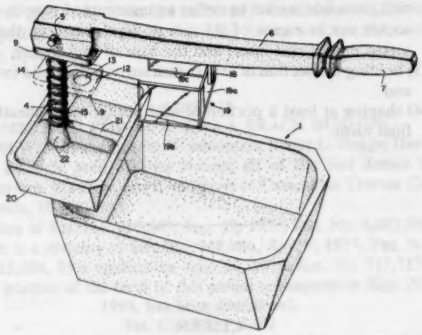
**William E. Davis, 762 Lindo La., Port St. Lucie, Fla. 33452**

**Filed Jul. 25, 1977, Ser. No. 818,569**

**Int. Cl.[2] A47J *43/26***

**U.S. Cl. 30—120.3** **10 Claims**

1. A nut-cracking implement comprising, a base, a column journaled at its lower end to said base and rising vertically therefrom, a lever pivoted at its proximal end to the top end of said column, for pivoting about a normally-horizontal axis, an anvil adjustable on and along said column and fixable thereto at any selected position therealong, nut-abutment means fixed with said lever in offset relation with respect to said horizontal axis, a hollow box-like enclosure, of generally parallelepipedal form, and first means mounting said enclosure to said lever for



translation therealong, from a first retracted position to a second position enclosing said anvil.

---

**4,128,939**

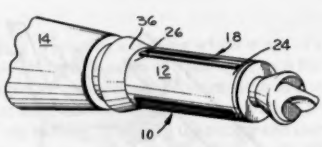
## PEELING CUTTER

**Robert L. Schaeffer, Leroy, N.Y., assignor to General Electric Company, Bridgeport, Conn.**

**Filed Apr. 11, 1977, Ser. No. 786,649**

**Int. Cl.[2] B26B *1/00***

**U.S. Cl. 30—123** **4 Claims**




1. A cutter mechanism for a vegetable peeler having a cylindrically electrically rotatable body with a longitudinal mounting shaft and a plurality of longitudinally extending slots coextensive with and equally spaced around the body with a cutter blade disposed lengthwise from the body outer to inner end in each slot, an improved slot and blade configuration comprising,

each blade disposed in its slot with its entire cutting edge angled in the direction of rotation and with a height above the body peripheral surface a maximum of 0.030 inches (0.75 mm) and a minimum of 0.008 inches (0.20 mm),

a clearance recess below and coextensive with each blade and extending substantially at a right angle to the blade in the direction of rotation with a peripheral width from substantially 0 to 0.180 inches (4.5 mm) respectively,

the width varying inversely with blade height so clogging of peelings and cutting of the user's skin is a minimum.

---

**4,128,940**

## GUIDE AND ADAPTOR FOR HAND SAWS

**José K. Ong, 3541 University St., Montreal, Quebec, Canada (H3A 2A9)**

**Filed Oct. 20, 1977, Ser. No. 844,053**

**Int. Cl.[2] B27B *9/04***

**U.S. Cl. 30—373** **14 Claims**

1. A guide and adaptor for a power hand saw having a blade, said guide and adaptor used for obtaining a straight line cut of a board in different widths, comprising:

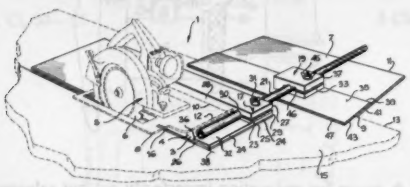
a first member adapted to receive at least a part of said hand saw,

a second member provided with a first edge means and a second opposite edge means, said first edge means being

adapted to rest in a first predetermined position against one edge of said board, and said second edge means being adapted to rest in a second reversed predetermined position against said one edge of said board,

tubular means

a first adjustment means on said first member and a second adjustment means on said second member for slidably receiving said tubular means, said first and second adjustment means adjustably positioning said second member at a predetermined distance from said first member, thus



fixing the distance between the saw blade and said first edge means of said second member, said first edge means in said first predetermined position resting against said one edge of said board, yet said adjustment means permitting the reversal of said second member such as to permit said second edge means to rest against said one edge of said board at a predetermined distance from said saw blade, in said second predetermined reversed position the distance between said second edge means and said saw blade being adjustable to a smaller value than in said first predetermined position.

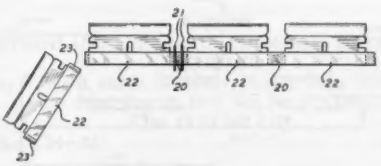
---

**4,128,941**

## SHEATHED RAZOR BLADE

**Earle T. Holsapple, III, 758 Springfield Ave., Summit, N.J. 07901**

**Filed Sep. 22, 1977, Ser. No. 835,577**
**Int. Cl.[2] B26B *29/02***
**U.S. Cl. 30—151** **4 Claims**



1. A sheathed razor blade comprising:

a. a razor blade having a cutting edge,

b. a folded sheet covering the portion of both sides of the razor blade adjacent to the cutting edge,

c. the fold of the sheath in general registration with the cutting edge of the blade,

d. portions of the sheath extending laterally perpendicular to and beyond sides of the razor blade adjacent to the cutting edge, defining a small perpendicular tab at the sides of the blade, enabling the sheath to be picked off,

e. the portions of the sheath extending beyond the sides of the blade adjacent to the edge overlapped at least in part with each other,

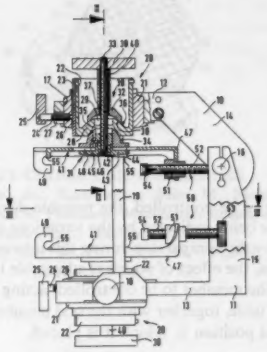
f. the overlapped portions of the sheet at the sides adjacent to the cutting edge adhered to each other.

**4,128,942**

## DENTAL ARTICULATOR

**Hans B. Schleich, Nendeln, Liechtenstein, assignor to Etablissement Dentaire Ivoclar, Schaan, Liechtenstein**

**Filed Dec. 1, 1976, Ser. No. 746,576**
**Claims priority, application Fed. Rep. of Germany, Dec. 3, 1975, 2554410**
**Int. Cl.[2] A61C *11/00***
**U.S. Cl. 32—32** **12 Claims**



3. A dental articulator having a pair of opposed mountings each of which is itself mounted on arms adjustable and fixable in relationship to the opposed mounting and each of which has a spherical axial bearing for adjustably connecting a support for one of the mandibular and maxillary models wherein each of said mountings comprises said spherical axial bearing at least partially contained within a sliding bushing, said sliding bushing axially adjustably and fixably disposed in a bearing ring, said bearing ring disposed in a bore, said bore provided within each of said arms, wherein each of said model supports is connected to a member a portion of which passes through said sliding bushing and said spherical axial bearing, for the spherical and axial adjustment and fixation of said model support, and wherein within said sliding bushing there is a wall having an upwardly extending spherical bearing surface of said spherical axial bearing and a central bore extending therethrough, through which central bore passes a bolt of said member, to which bolt said model support is attached, said bolt carrying a counter bearing element, said counter bearing element being fixable for the alignment of said model support with respect to said spherical bearing surface.

---

**4,128,943**

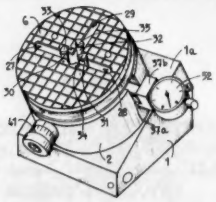
## APPARATUS FOR CONTROLLING INNER AND OUTER SURFACES, OF MEMBERS OF MECHANICS, AND UTILIZATION OF THIS APPARATUS

**Henri Muhlethaler, Chemin Es-Pierres 2, 1422 Les Tuileries de Grandson Canton of Vaud Lucens, Switzerland, assignor to Henri Muhlethaler S.A., Canton of Vaud, Switzerland**

**Filed Apr. 11, 1977, Ser. No. 786,099**
**Claims priority, application Switzerland, Apr. 13, 1976, 4671/76**
**Int. Cl.[2] G01B *5/20, 5/28***
**U.S. Cl. 33—174 Q** **10 Claims**

1. Apparatus for controlling inner and outer surfaces of mechanical members comprising a planar table intended to receive the member to be controlled, the surface to be controlled of this member being perpendicular to the upper surface of the said table, at least three interconnecting elongated apertures provided in said table, three feelers extending through said aperatures and projecting above said table, said feelers being radially adjustable in their position in function of the geometry of the member to be controlled, a return spring connected to one of the said feelers for urging said one of said

feelers against the said surface, a comparator further connected to said one of said feelers for indicating its position, characterized by the fact that the said table is inclined so that, by gravity, the member rests, by its surface to be controlled, on the said three feelers, the said table moreover movable in a direction perpendicular to its upper surface, so as to permit, while moving it along the said direction, to move the member parallel to



the surface to be controlled, the possible discrepancies of the said surface being indicated by the variations of the indications furnished by the comparator during this movement, a device of sustentation, the effect of which is adjustable in function of the weight of the member to be controlled, acting on the said table so that the table, together with the said member, be maintained in any axial position in which it is placed.

---

**4,128,944**

## MICROSCOPE ASSEMBLY

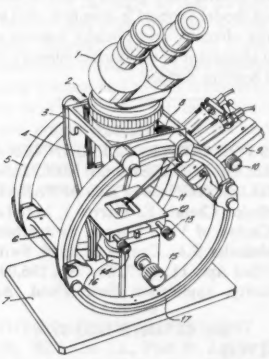
**Martin G. Stanton, 9 Priestden Park, St. Andrews, Fife, Scotland**

**Filed Dec. 16, 1976, Ser. No. 751,481**

**Claims priority, application United Kingdom, Dec. 18, 1975, 51985/75**

**Int. Cl.[2] G02B *21/32***

**U.S. Cl. 33—180 R** **6 Claims**



1. An assembly of a microscope which includes a stage and at least one micromanipulator, comprising a base, two rigid parallel spaced apart rings mounted on said base, said base and rings together forming a rigid main frame on which at least said microscope stage and said at least one micromanipulator are rigidly mounted, and means for mounting said microscope stage on said rings whereby said microscope stage can be tilted.

**4,128,945**

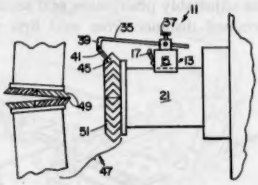
## EASILY ATTACHABLE AND DETACHABLE GAUGE FOR RE-LOCATING TESTED BEVEL GEARS ON A GEAR-CUTTING MACHINE

**Murrell R. Barritt, 2208 Keokuk Dr., Springfield, Ill. 62702**

**Filed Mar. 15, 1977, Ser. No. 777,654**

**Int. Cl.[2] G01B *5/00*; B23C *3/04***

**U.S. Cl. 33—181 R** **4 Claims**



1. A gauge for re-locating imperfectly cut but salvageable bevel gears removed for testing from a gear-cutting machine having a horizontally disposed rotatable gear-supporting mandrel upwardly covered by a co-axial cylindrically curved ferromagnetic sheet, said gauge comprising: a base member partly of magnetic material having an elongated shallow channel, of inverted V-shape in cross-section, in its bottom surface for magnetically firmly attaching said base member to said ferromagnetic sheet; a pair of spaced upright members fixed to the top of said base member; a cylindrically bored body positioned between said upright members; means pivotally and frictionally holding said bored body in positions rotated about a horizontally disposed axis transverse to the bore of said bored body; a cylindrical arm rotatably and axially adjustably received in the bore of said bored body; a probe member connected to an end of said arm and extending downwardly therefrom and having a rounded-body tip for insertion between adjacent teeth of a gear mounted on said mandrel.

---

**4,128,946**

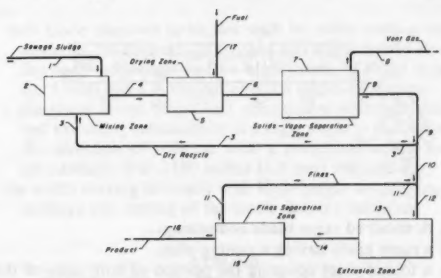
## ORGANIC WASTE DRYING PROCESS

**Vere Maffet, Oak Park, Ill., assignor to UOP Inc., Des Plaines, Ill.**

**Filed Mar. 8, 1977, Ser. No. 775,673**

**Int. Cl.[2] F26B *7/00***

**U.S. Cl. 34—12** **7 Claims**




1. In a process for the drying of fibrous sewage sludge wherein a feed stream comprising water and fibrous sewage sludge is passed through a drying zone operated at drying conditions and effecting the evaporation of water contained in the feed stream and the production of a drying zone effluent stream, the drying zone effluent stream is passed into a solids-vapor separation zone wherein fibrous sewage sludge originally contained in the feed stream is concentrated in a dry solids stream, and at least a portion of the dry solids stream is compacted and formed into solid particles having a bulk density within the range of about 30–65 lb/ft$^3$ the improvement

which comprises passing said portion of the dry solids stream which is to be compacted through an extrusion zone wherein said portion is passed through a die plate and formed into pellets of a desired size and density.

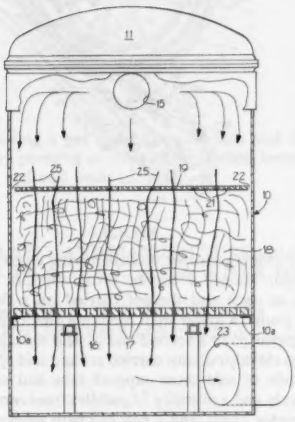
---

**4,128,947**

## PROCESS AND APPARATUS FOR DRYING TEXTILE STOCK AND THE LIKE

**Harry C. Jackson, 2120 Country Club Rd., Columbus, Ga. 31906**

**Filed Jan. 19, 1977, Ser. No. 760,456**
**Int. Cl.[2] F26B** *7/00, 19/00*
**U.S. Cl. 34—12** **3 Claims**



1. The process of drying textile stock and the like which comprises:
(a) supporting a column of the stock in a closed vessel on a liquid and air permeable base,
(b) placing a floating, air permeable plate on top of the column of stock to be dried,
(c) closing the vessel to provide an air space above said plate, and
(d) supplying said air space with heated air under pressure, whereby the plate is forced downwardly against the base, thus to compress the stock and heated air passes through the plate, stock and base, along a plurality of paths.

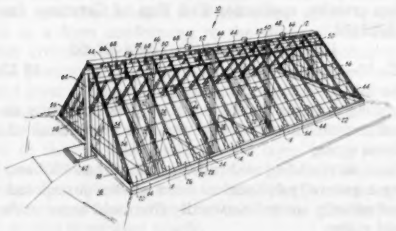
---

**4,128,948**

## METHOD AND APPARATUS FOR GRAIN DRYING AND STORAGE

**Gary F. Wood, 615 N. Broadway, Hobart, Okla. 73065**

**Filed May 21, 1975, Ser. No. 579,454**
**Int. Cl.[2] F26B** *3/28*
**U.S. Cl. 34—33** **12 Claims**



1. A method for effecting storage and drying of grain, comprising:
forming an earth cavity having planar equi-angular polyhedral characteristics wherein the slope angle of the planar surfaces relative to earth horizontal approximates the angle of repose of the grain;
covering said earth cavity containing said grain with a ray transmissive covering to provide sun's heat to the grain; and
gradually moving said grain from the apex of a tetrahedral earth cavity vertically upward and outward along the grain reposition surface for circulation back to the apex.

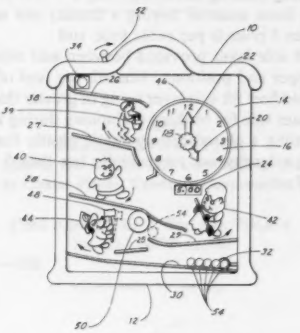
---

**4,128,949**

## TOY CLOCK USING MARBLES

**Gabriel Marason, Jr., Hawthorne; John M. Melzian, Palos Verdes, and Alan R. Pitkanen, Manhattan Beach, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.**

**Filed Mar. 28, 1977, Ser. No. 782,300**
**Int. Cl.[2] G09B** *19/12*
**U.S. Cl. 35—39** **18 Claims**

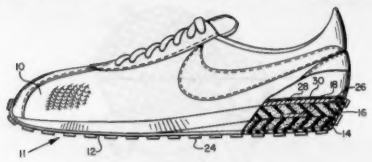


1. In a toy clock, the combination comprising:
a housing having a viewable surface adapted for vertical positioning;
means on said surface for indicating the time, said means having drive means coupled thereto for varying the time so-indicated;
means coupled adjacent said surface for guiding marbles from the top to the bottom thereof under the force of gravity;
means communicating with said guiding means adjacent the bottom of said surface for conveying said marbles to the top of said surface in response to actuation of said drive means;
means communicating with said conveyor means for retaining said marbles adjacent the top of said surface;
means operable by said drive means for selecting from said retaining means a number of marbles corresponding to the hour of the time so-indicated; and
an escapement mechanism for releasing sequentially the so-selected number of marbles at the top of said surface into communication with said guiding means, said escapement mechanism including a manually operable release lever and means adjacent said guiding means in the path of travel of said marbles thereon, said release lever being operable for releasing the first of the so-selected number of marbles, and subsequent marbles being released in response to impact of each marble traversing said guiding means and impacting with said means adjacent said guiding means.

## 4,128,950
## MULTILAYERED SOLE ATHLETIC SHOE WITH IMPROVED FOAM MID-SOLE

William J. Bowerman; Stanley L. James, and Dennis E. Vixie, all of Eugene, Oreg., assignors to BRS, Inc., Beaverton, Oreg.

Filed Feb. 7, 1977, Ser. No. 766,530
Int. Cl.[2] A43B *13/12, 13/18, 13/28, 23/28*
U.S. Cl. 36—30 R 24 Claims



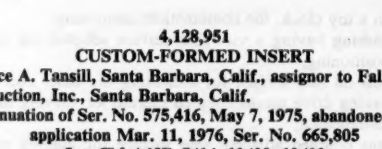

1. An athletic shoe comprising:
a shoe upper;
an outer sole;
an intermediate sole layer provided between said outer sole and said upper, said intermediate sole layer being of greater thickness than said outer sole for resilient cushioning during running and comprising a closed cell synthetic plastic foam material having a density not substantially less than 5 pounds per cubic foot; and
a heel lift sole layer provided between said outer sole and said upper and positioned beneath the heel of a wearer's foot, said heel lift sole layer being of greater thickness than said outer sole for resilient cushioning during running and comprising a closed cell synthetic plastic foam material having a density not substantially less than 5 pounds per cubic foot.

---

## 4,128,951
## CUSTOM-FORMED INSERT

Horace A. Tansill, Santa Barbara, Calif., assignor to Falk Construction, Inc., Santa Barbara, Calif.

Continuation of Ser. No. 575,416, May 7, 1975, abandoned. This application Mar. 11, 1976, Ser. No. 665,805
Int. Cl.[2] A43B *7/14, 13/38, 19/00*
U.S. Cl. 36—44 4 Claims

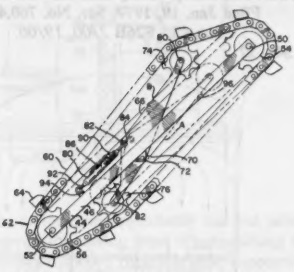



1. A ready-made shoe insert comprising:
an outer container having flexible, generally parallel upper and lower walls;
an inner container whose volume is small compared to the volume of said outer container, disposed within said outer container;
a quantity of curable liquid elastomeric material filling the remaining interior of said outer container;
a quantity of liquid catalyst filling said inner container; and
said inner container being frangible whereby said outer container may be compressed in order to rupture said inner container without rupturing said outer container.

## 4,128,952
## MECHANICAL CHAIN ADJUSTER FOR SCRAPER ELEVATOR CHAINS

Edward D. Duke, Chicago, and Joan M. Riordan, Glenview, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Nov. 14, 1977, Ser. No. 850,880
Int. Cl.[2] B60P *1/36;* B65G *23/44*
U.S. Cl. 37—8 21 Claims




1. An elevating scraper vehicle having an elevator including an elevator frame, a driven cross support tube having a sprocket at each end thereof carried on a first end of said elevator frame, a lower shaft having a chain guide at each end thereof mounted to a second end of said elevator frame, a pair of endless elevator chains carried around said sprocket and said chain guide of said cross support tube and said lower shaft respectively and a plurality of paddles transversely mounted to each elevator chain, and a pair of chain tensioners each chain tensioner comprising:
a turnbuckle anchor, fixedly mounted to said elevator frame;
a turnbuckle having a first end attached to said turnbuckle anchor;
a bracket fixedly mounted to said elevator frame between said turnbuckle anchor and said driven cross support tube;
an idler arm pivotally mounted to said bracket on said elevator frame, said idler arm attached to a second end of said turnbuckle;
an idler wheel mounted for rotational movement to said idler arm in the same plane as said endless chain between said frame and said chain whereby adjustment of said turnbuckle resulting in a decreased length thereof urges said idler wheel against said chain urging said chain away from said elevator frame increasing the chain tension.

---

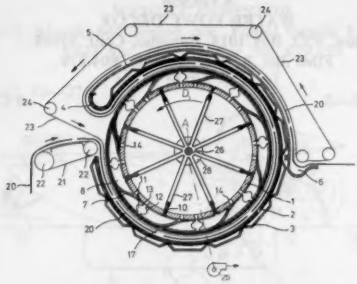
## 4,128,953
## IRONING MANGLE WITH PNEUMATICALLY PRESSURIZABLE ROLLER COVERING

Friedrich Geiger, Augsburg, Germany, assignor to Firma Kleindienst & Co. Maschinenfabrik, Augsburg, Germany

Filed Jan. 23, 1978, Ser. No. 871,473
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1977, 2702472
Int. Cl.[2] D06F *63/00, 71/36, 83/00*
U.S. Cl. 38—56 15 Claims

1. An ironing mangle comprising:
an ironing roller having a generally cylindrical outer surface and rotatable about a roller axis in a predetermined rotational sense;
a sleeve surrounding said roller by more than 180° and having a generally cylindrical inner surface juxtaposed with and radially spaced outwardly from said outer surface of said roller;
a plurality of cushions each having an inner wall lying mainly on said outer surface, an outer wall between said inner wall and said inner surface of said sleeve, and a sealed periphery defining between said walls a pressurizable chamber;

mounting means for securing said cushions to said outer periphery at angularly offset locations for orbiting of said cushions about said axis on rotation of said roller; and



means for feeding a gas under pressure into said chambers and thereby pressing an item to be pressed between said outer wall and said inner surface.

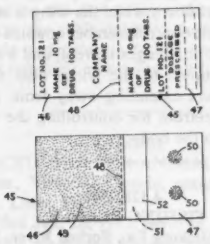
---

**4,128,954**

## PACKAGE LABEL AND MANUFACTURE OF SAME

**Rollin T. White, Westfield, N.J., assignor to NJM, Inc., Hoboken, N.J.**

**Filed Mar. 11, 1977, Ser. No. 776,534**
**Int. Cl.[2] G09F *3/00;* A61F *13/02;* B32B *3/14, 7/06***
**U.S. Cl. 40—310** **7 Claims**



1. The article which comprises a container for a product having a label bearing surface portion, and a label proper on such container comprising an unfolded sheet of label paper overlying said container surface portion as a single layer, said sheet being weakened transversely to provide two sections separable from one another, each of said sections having provided on its face side information relating to the particular product packaged in the container, a first of said sections having on its back side an adhesive permanently affixing said first section to the container, the second of said sections having on a first portion of its back side an adhesive removably affixing said second section to the container, whereby both of said sections hold the unfolded label sheet as a whole on the container in a form conforming to the shape of the container surface covered thereby, a pressure sensitive adhesive on a second portion of the back side of said second section and a second layer of material having a release coating thereon and covering said pressure sensitive adhesive to render the latter adhesively inoperative while said second label section is adhered to the container, said second layer being removable when said second label section is detached from the container and said first label section to render the pressure sensitive adhesive operative to adhere the back of the detached second label section to another article.

2. A label having a face side bearing label indicia and having a back side to be adhesively connected to a package but prior to such attachment being adhesively inoperative throughout its entire area, said label comprising a first layer having two sections separably connected together and each bearing on its face side indicia pertinent to a given product, the first of said sections having a back side adapted to be rendered adhesive to affix said first section permanently to a package, the second of said sections having on its back side in a reduced area thereof a pressure sensitive adhesive, the remainder of the back side area of said second section being adapted to be rendered adhesive to removably affix said second section to a package, whereby both sections of the applied label are capable of being simultaneously secured to the package to hold the label, as a whole, in a form conforming to the shape of the package surface covered by the label, the first section permanently and the other removably, a second layer of material having a release coating overlying the back side of said second section and covering only said pressure sensitive adhesive to render the latter adhesively inoperative when the back side of said second label section is adhesively secured to a package, said second layer being removable when said second label section is freed from its attachment to the package to render the reduced area of pressure sensitive adhesive operative to adhere the back of said freed second label section to another article.

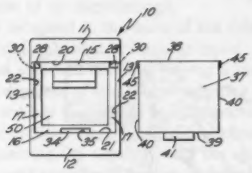
---

**4,128,955**

## EXHIBITING DEVICE

**Michael R. Marra, and Joseph Del Deo, both of Warwick, R.I., assignors to Cowan Plastic Products Corporation, Providence, R.I.**

**Filed Apr. 22, 1977, Ser. No. 790,074**
**Int. Cl.[2] G09F *11/00***
**U.S. Cl. 40—489** **3 Claims**



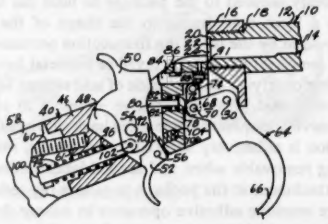
1. An exhibiting device comprising a one-piece frame member having a front surface with a recess of an enclosed geometric figure depressed therefrom providing edges thereabout and a portion of a bottom wall extending along said edges completely about said figure leaving a mid portion open, an insert member of a size and shape to fit said recess and enter said recess from said front surface by engaging an edge thereof and then swinging into position about said edge as a pivotal axis without projecting through said bottom wall and engage said portion of said bottom wall with its edges engaging the edges of said recess for locating its position, a tongue on said insert member along one of its edges and an opening in said bottom wall along the engaged edge of said recess to receive said tongue, a pair of tongues at spaced locations along opposite edges of said insert member and openings in said bottom wall along the edge of said recess at the location of said tongues to receive said tongues, said openings being at the juncture of said recess edges and bottom wall and means to provide a lip along each of said openings by a reduction of the thickness of stock along the portion bordering said recess and each of said tongues after passing through an opening engaging a lip to hold the insert member in place against said bottom wall.

4,128,956

## SINGLE SHOT RIFLE HAVING FALLING BREECHBLOCK INTEGRAL WITH STOCK

John P. Foote, 315 Piedmont Rd., Marietta, Ga. 30006

Filed Jul. 22, 1977, Ser. No. 818,460
Int. Cl.[2] F41C *11/04*
U.S. Cl. 42—23 13 Claims



1. In a single shot rifle:
a barrel having a cartridge chamber therein,
a breechblock assembled on said barrel for substantial upwardly and downwardly movement thereon to open and close said cartridge chamber for the purpose of inserting or removing a cartridge,
a stock connected to and movable with said breechblock on said barrel,
and means on said rifle for moving said breechblock upwardly and downwardly from an upward position to a downward position and vice versa.

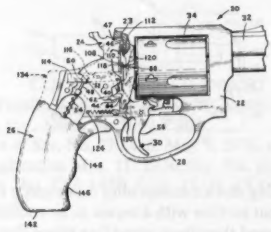
---

4,128,957

## REVOLVER-TYPE HAND GUN

Joseph L. Lee, Woodbridge, Conn., assignor to Stephen Andrew Lee, Woodbridge, Conn.

Filed Jan. 6, 1977, Ser. No. 757,212
Int. Cl.[2] F41C *1/00*
U.S. Cl. 42—65 14 Claims



1. In a firearm having a frame, a hammer pivotally mounted in said frame, a trigger pivotally mounted in said frame below said hammer and coacting with said hammer to move said hammer from a cocked position to a firing position upon actuation of said trigger, a cartridge-receiving cylinder rotatably mounted in front of the hammer and hand means connected to said trigger and including a hand coacting with said cartridge-receiving cylinder to rotate said cylinder responsive to actuation of said trigger, and a firing pin resiliently extending from said frame, a improved hammer construction comprising:
a sear pivot pin fixed to said hammer;
a sear pivotally mounted on said sear pivot pin to allow one end of said sear to translate toward and away from said cylinder, to coact with said trigger;
sear stop means fixed to said hammer between said sear pivot pin and said translating end of said sear to limit movement of said sear; and
resilient means connected to said hammer to urge said translating end of said sear towards said cylinder until stopped by said sear stop means to resiliently position said translating end of said sear.

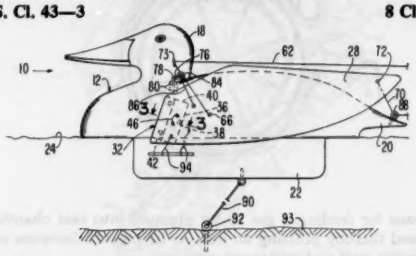
---

4,128,958

## WATER FOWL DECOY

Marvin Snow, P.O. Box 1014, Paradise, Calif. 95969

Filed Jun. 8, 1977, Ser. No. 804,679
Int. Cl.[2] A01M *31/06*
U.S. Cl. 43—3 8 Claims



1. A water fowl decoy comprising: a body having a pair of opposed sides and being formed of a material capable of floating on the surface of the water; a pair of wings, there being a wing for each side of the body, respectively; a hinge for each wing, respectively, each hinge being pivotally mounted on the body to permit the corresponding wing to move from a retracted position extending along a respective side of the body to an operative position extending outwardly from the body, each hinge further having means permitting the corresponding wing to move up and down when the wing is in the operative position; a first flexible control member coupled to the wings at locations adjacent to the hinges thereof; and a second flexible control member coupled to the wings near the outer ends thereof, said members extending away from the body to a location remote therefrom for controlling the movements of the wings relative to the body.

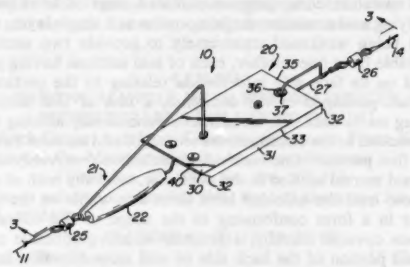
---

4,128,959

## FISHING PLANER

Adolf Staaden, 404 Hickory La., Forked River, N.J. 08731

Filed Aug. 5, 1977, Ser. No. 822,063
Int. Cl.[2] A01K *85/00*
U.S. Cl. 43—43.13 8 Claims

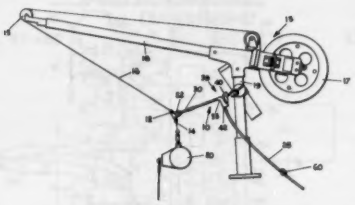


1. A fishing planer comprising a vane, an upstanding bail portion upstanding from said vane to an upper bail region, upper securement means securing said upstanding bail portion to said vane, a declining bail portion declining from said upper bail region forwardly beyond said vane to a forward bail region, a lower bail portion extending rearwardly from said forward region beneath said vane to a rearward bail region, lower securing means securing said rearward bail region to said vane, weight means on said lower bail portion adjacent to said forward bail region, and fastener means fastening an intermediate bail region of said lower bail portion to said vane, to

effectively minimize the stress imparted to said upper and lower securing means.

---

**4,128,960**
**WEIGHT ARRESTOR**
**Larry L. Marek, 444 Benson, NE., Grand Rapids, Mich. 49503**
**Filed Apr. 23, 1976, Ser. No. 679,658**
**Int. Cl.[2] A01K *87/04***
**U.S. Cl. 43—27.4** **9 Claims**



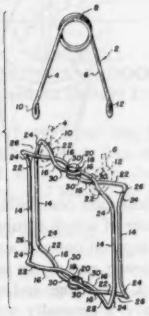
1. A cable arrestor for drawing a downrigger cable in to the back of a boat from a position rearward of the back of the boat, comprising:

a flexible tubular cable guide surrounding the cable, the cable being easily slidable through the cable guide, the cable guide being fabricated such that the cable guide resiliently defects into a smooth arc and prevents sharp bends in the cable when the cable guide is pulled in to the back of a boat, the radius of said smooth arc being significantly larger than the diameter of the cable; and

tether line means attached to the cable guide and adapted to extend from the cable guide to the boat for drawing the cable guide and cable in to the back of the boat; and releasable fastening means for securing the tether line to the boat.

---

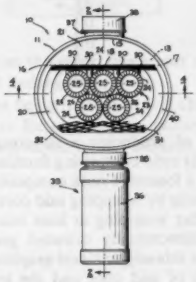
**4,128,961**
**ACTUATOR FOR ANIMAL TRAP**
**Frank Conibear, Victoria, Canada, assignor to Woodstream Corporation, Lititz, Pa.**
**Filed Jan. 26, 1977, Ser. No. 762,660**
**Claims priority, application Canada, Feb. 27, 1976, 246769**
**Int. Cl.[2] A01M *23/26***
**U.S. Cl. 43—88** **6 Claims**



1. An animal trap having two similar frames made of round wire stock, each frame having jaw-forming sides that lie in a common plane and ends extending there-between to support said jaws, said ends each having a central portion in which the frames are pivotally connected through adjacent ends for rotation about a common axis between set and closed positions, and outer portions on each side of the central portion extending to said jaws, and at least one actuator capable of rapidly and forcefully effecting such rotation, said actuator having two arms spring biased at one end so that the other ends, if unobstructed, would move apart to a distance substantially greater than the width of said frame ends, each arm terminating in a ring adapted to encircle adjacent ends of both frames on opposite sides of said axis, each actuator ring being inclined towards the other ring of the other arm in said set position of the trap and said rings having a substantially parallel relationship when said actuator forces said frames into a closed position.

---

**4,128,962**
**BUBBLE DISCHARGING DEVICE**
**Paul R. Anderson, 23701 Surf Cove, Laguna Niguel, Calif. 92677**
**Filed Sep. 16, 1976, Ser. No. 723,806**
**Int. Cl.[2] A63H *33/28***
**U.S. Cl. 46—7** **7 Claims**



1. A bubble discharging device adapted to be mounted on a vehicle, which comprises:

a tube having an entrance, an exit end and a bore for receiving a stream of air therethrough,

a receptacle mounted in the bore of the tube for storing a quantity of soapy bubble forming liquid, the receptacle forming an enclosed chamber having a cross-section defined by a segment of said tube comprising an upper inner wall, a chord-like flat bottom wall connecting the extremities of the arc-like upper wall and opposed verticle end walls connecting the segment with the arc and chord of said tube, said receptacle further including a liquid refill opening in said upper wall to refill said reservoir with said liquid,

a multiple ring structure having plural openings therethrough supported downwardly from said reservoir, the structure being stationed with the openings placed normal to the direction of the air-stream and adapted to be wetted by a film of the liquid across the opposite sides of said plural openings,

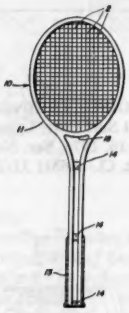
orifice means incorporated in said receptacle arranged to direct flowing beads of said liquid on both sides of said openings, said structure being adapted to form a bubble from the film stretched across said openings and release a succession of bubbles into said air-stream when said air-stream is passed through said openings and subsequently discharged from the exit end of said tube, and

a sump connected to a lower wall of said tube having a port extending through the wall adjacent said exit end, the sum being adapted to collect the drips of said liquid not consumed in forming said bubbles, the port being reinforced by an internally threaded sleeve surrounding said port and said sump and further including an elongated cylindrical enclosure having the open end of the enclosure threadedly engaged in the sleeve.

## 4,128,963
## METHOD FOR PREPARING A COMPOSITE HIGH STRENGTH TO WEIGHT STRUCTURE WITH FRAY RESISTANCE

Pol Dano, Camarillo, Calif., assignor to Fansteel, Inc., North Chicago, Ill.

Division of Ser. No. 703,135, Jul. 7, 1976, Pat. No. 4,070,020.
This application Nov. 25, 1977, Ser. No. 854,809
Int. Cl.[2] B29D *27/00*
U.S. Cl. 264—46.6 12 Claims



1. A method of producing a structural member of high strength to weight ratio comprising forming an elongated core strip comprising a foamable resin composition, forming a shell about said core strip by wrapping said core strip with a veiling strip and thereafter wrapping at least one elongated sheet of resin-coated unidirectionally oriented graphite fibers about said core with the side edges of said graphite fiber strip running along the length of said core and the trailing edge of said veiling strip covering the leading edge of said graphite fiber strip, placing said wrapped core within a mold cavity, sealing said mold cavity, activating said foamable resin composition to cause expansion thereof and generate pressure within said mold cavity pressing said core against said shell and thereby providing intimate bonding of said core to said shell, and thereafter removing said core and said shell from said mold cavity as an integral composite structure.

---

## 4,128,964
## TRANSFER MECHANISM INTENDED FOR USE IN TOYS

Toyotsugu Ogasawara, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Jul. 11, 1977, Ser. No. 814,228
Claims priority, application Japan, Jul. 16, 1976, 51/95487
Int. Cl.[2] A63H *33/00*
U.S. Cl. 46—43 13 Claims

1. A transfer mechanism for use in moving an article from a first location to a second location which comprises:

a base,

an externally threaded shaft rotatably mounted on said base so as to extend upwardly therefrom,

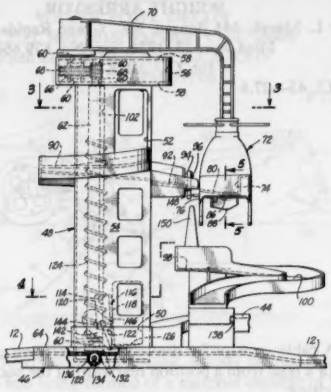
a tower supported on said base so as to extend upwardly therefrom adjacent to said shaft,

a carrier for holding said article and for supporting said article as it is moved from said first location to said second location,

cooperating guide means on said tower and on said carrier for controlling movement so that during rotation of said shaft said carrier can be elevated along the length of said shaft and can be pivoted with respect to said shaft,

said carrier including a thread like projection capable of fitting against the thread on said shaft,

the weight of said carrier being distributed so that said carrier can pivot generally away from said shaft in order to enable said projection to slide downwardly over said thread on said shaft when there is no weight on said carrier and so that said carrier will pivot generally toward said shaft so as to hold said projection in engagement with said shaft when said article is located on said carrier, and



power transmission means for use in rotating said shaft operatively connected to said shaft.

---

## 4,128,965
## PLANT STAKE

August J. D'Hondt, Rte. 2, Box 385, Sonora, Calif. 95370

Filed Jun. 6, 1977, Ser. No. 803,608
Int. Cl.[2] A01G *17/06*
U.S. Cl. 47—47 3 Claims

1. A telescoping plant stake comprising at least two telescoping members, the outer of which is tubular;

a plug having a flange on one end and having its other end inserted in the lower end of the inner most of said telescoping members, said flange and said lower end defining an annular groove, a generally annular elastomeric friction member secured in said groove and having an outer periphery which is convex in cross-section said outer periphery having a plurality of outward extending local protuberances;

said protuberances having a height sufficient that when the outer and inner members are assembled, said protuberances are in compressed contact with the inner wall of said outer tube, said protuberances including tapers extending in each direction of telescoping movement of said telescoping members.

## 4,128,966
## INFLATABLE TERRARIUM ASSEMBLY WITH CONTROLLED ENVIRONMENT

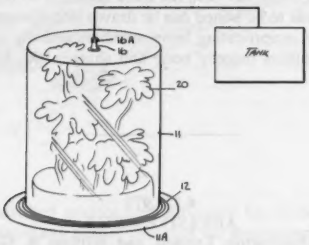
**Donald Spector, Union City, N.J., assignor to Applied Research Commodities Ind., Inc., Hyattsville, Md.**

**Continuation-in-part of Ser. No. 632,708, Nov. 17, 1975, Pat. No. 3,995,396, which is a continuation-in-part of Ser. No. 532,518, Dec. 17, 1974, Pat. No. 3,939,607. This application Nov. 10, 1976, Ser. No. 740,664**

**The portion of the term of this patent subsequent to Dec. 7, 1993, has been disclaimed.**

**Int. Cl.[2] A01G 9/02**

**U.S. Cl. 47—69** **11 Claims**




1. A collapsible terrarium assembly for protectively housing an organic product in a controlled environment comprising:

A. a base having a circular ridge formed on the upper face thereof adjacent to and concentric with the periphery of the base;

B. a replaceable dome mountable on the base and constituted by a flexible, non-self-supporting bag fabricated of plastic film material having a circular open mouth from which an annular skirt extends outwardly, the diameter of the mouth being somewhat smaller than the diameter of the ridge, whereby the dome is seated within the ridge and the skirt lies thereover;

C. a removable coupling ring attachable to the ridge to clamp the skirt of the dome therebetween to hermetically seal the dome to define an enclosure; and

D. means to inflate the dome with a gas to cause the dome to assume an erect form, said gas being substantially free of oxygen and providing a controlled environment for said product.

---

## 4,128,967
## WINDOWS AND DOORS

**Bernhard Kirsch, Im Litzelholz 23, 5500 Trier-Biewer, Fed. Rep. of Germany**

**Filed Apr. 7, 1977, Ser. No. 785,345**

**Claims priority, application Fed. Rep. of Germany, Apr. 14, 1976, 2616422; May 12, 1976, 2621026; Jun. 21, 1976, 2627727**

**Int. Cl.[2] E06B 7/28**

**U.S. Cl. 49—318** **4 Claims**

1. In a closure system including:

a frame including an outer frame part and an inner frame part located inward from the outer frame part, such frame parts forming the sides of a strip-receiving slot therebetween;

connector means connecting the frame parts;

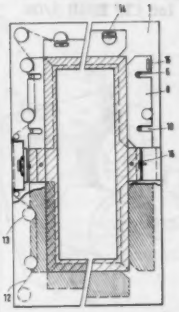
a closure member mounted in the frame for movement relative thereto between closed and open positions, such closure member having a peripheral guide groove opening toward the strip-receiving slot between the frame parts when the closure member is in closed position;

an elongated sealing and locking strip mounted in the strip-receiving slot for movement relative to the frame transversely of the length of such strip; and

means for moving the sealing and locking strip relative to the frame outward of the slot and toward the closure member for engagement of such strip in the peripheral guide groove of the closure member;

the improvement comprising:

the inner frame part being of U-shaped cross section and forming a channel opening at the side of the inner frame




part remote from the outer frame part and remote from the sealing and locking strip;

the moving means being located in said channel; and

a removable cover for closing the channel opening to enclose the moving means in said channel.

---

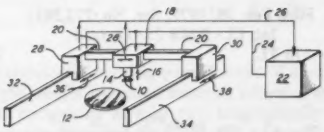
## 4,128,968
## OPTICAL SURFACE POLISHER

**Robert A. Jones, Ridgefield, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.**

**Filed Sep. 22, 1976, Ser. No. 725,382**

**Int. Cl.[2] B24C 7/02**

**U.S. Cl. 51—54** **21 Claims**




1. An apparatus for polishing or grinding an optical surface comprising, in combination:

at least one polishing pad;

a pad drive means coupled to each said pad for maintaining each said pad in contact with the surface being polished or ground and moving each said pad relative to the surface being polished or ground so that a removal profile is produced having circular symmetry with peak removal at the center of pad movement and minimal removal at the extremes of pad movement; and

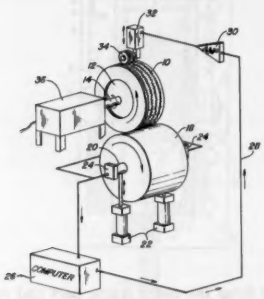
a position drive means coupled to said pad drive means to move said pad drive means along a contour path, said contour path having adjacent path segments that intersect any given contour radius extending from the contour center to the contour perimeter at a constant distance from each other.

**4,128,969**

## APPARATUS FOR REDUCING TANGENTIAL FORCE VARIATION IN PNEUMATIC TIRES

**Kenneth J. Gormish, Tallmadge, and Clarence Hofelt, Jr., Hudson, both of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio**

**Filed Sep. 18, 1975, Ser. No. 614,381**
**Int. Cl.[2] B24B *5/00***
**U.S. Cl. 51—106 R** **6 Claims**




1. Apparatus for reducing tangential force variations in a pneumatic tire, which comprises:

(a) means for rotating the tire against a predetermined load at a speed of at least 300 rpm;

(b) means for sensing and measuring the force variations in the tangential direction while the tire is rotating at a speed of at least 300 rpm;

(c) means for determining the magnitude of the tangential force variations and the location of maximum magnitude of tangential force variations;

(d) means for comparing said magnitude to a predetermined level to determine if the tangential force variations are within acceptable limits; and

(e) means for grinding the inner ribs of the tread of the tire in accordance with the magnitude and the location of maximum magnitude of the tangential force variations if the tangential force variations exceed acceptable limits.

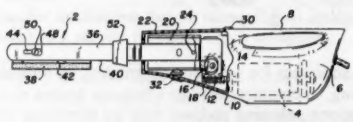
---

**4,128,970**

## HONE

**Peter Sawrenko, 5837 Patrick St., Burnaby, B.C., Canada (V5J 3B5)**

**Filed Feb. 28, 1977, Ser. No. 772,382**
**Int. Cl.[2] B24B *23/00, 3/36***
**U.S. Cl. 51—170 TL** **3 Claims**




1. In an household appliance adapted to slice foodstuffs including an electric motor, a motor compartment housing the motor and having means for holding the compartment, first and second drive attachments disposed within the compartment adjacent and end thereof and accessible from the exterior of the compartment, the drive attachments being mounted for relative reciprocal, linear movement and being further formed to receive a pair of reciprocating knife blades, and drive means operatively coupling the motor and the drive attachments for linearly reciprocating the attachments upon the energization of the motor, the improvement of means for converting the appliance into a blade honing and sharpening tool comprising:

first and second, linear carrying arms, each arm having a first end formed for engaging one of the drive attachments so that the attachments can linearly reciprocate the arms;

first and second hone members directly attached to the first and second arms, respectively, for linear reciprocating movement therewith, each member having an elongate configuration and extending in the direction of the respective carrying arms; and

means formed on the carrying arms for interengaging the arms and permitting them to linearly reciprocate with respect each other, while preventing substantial relative motion between the arms in other directions;

whereby the energization of the motor induces relative linear reciprocating motion between the carrying arms and therewith between the hone members so that an edge of a blade to be honed can be drawn into contact with the linearly reciprocating hone members and the reciprocating members thereby hone and sharpen the edge of the blade.

---

**4,128,971**

## ABRASIVE DRILL

**Bruce W. Dunnington, Lyndell, and William B. Gernert, St. Davids, both of Pa., assignors to Glennel Corporation, Chester Springs, Pa.**

**Filed Sep. 14, 1976, Ser. No. 723,153**
**Int. Cl.[2] B24D *17/00***
**U.S. Cl. 51—204** **13 Claims**

1. A cylindrical abrasive drill having an eccentric longitudinal solid, relatively non-abrasive cored portion throughout.

---

**4,128,972**

## FLEXIBLE POLISHING WHEEL AND METHOD FOR PRODUCING SAME

**Vernon K. Charvat, Bay Village, Ohio, assignor to The Osborn Manufacturing Corporation, Cleveland, Ohio**

**Filed Apr. 14, 1975, Ser. No. 567,775**
**Int. Cl.[2] C08G *51/12, 51/14***
**U.S. Cl. 51—298 R** **9 Claims**

1. An abrasive polishing wheel having a "Shore A" hardness of less than 96 and comprising,

(a) an abrasive grain in an amount of from about 55 to about 90% of the theoretical weight of grain required to fill the volume occupied by the wheel,

(b) from about 40% to about 55% by volume of an elastomer bond, said elastomer having an unfilled cured "Shore A" hardness of from about 50 to about 60 and a density of greater than 1 gram/cm$^3$,

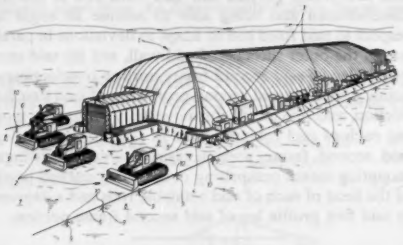
(c) from zero up to about less than 15% by volume of an inert filler having an average particle diameter of less than 10 microns, and

(d) less than 10% by volume of voids.

## 4,128,973
## METHOD AND APPARATUS FOR SECURING AND STABILIZING A LIGHTWEIGHT, COLLAPSIBLE STRUCTURE THAT IS MOVING ALONG A MOVING WORK SITE

Charles L. Robinson, 23 Bayou Shadows, Houston, Tex. 77024

Filed Nov. 8, 1977, Ser. No. 849,704
Int. Cl.[2] E04B *1/34;* B60V *3/02*
U.S. Cl. 52—2 9 Claims



1. A controlled environment structure for protection of a work area from any hostile effects of the atmospheric environment, said controlled environment structure being movable to selected positions along a moving work site and comprising:

platform means;

anchor tracks secured to the ground adjacent each side of said moving work site;

site engaging means;

said engaging means comprising a plurality of stability lines connected to said controlled environment structure and connected to said anchor tracks;

a lightweight building structure being attached to said platform means and providing a protective enclosure, said enclosure substantially containing said controlled environment, said lightweight building structure being formed of a thin flexible material maintained in erect condition responsive to maintenance of a superatmospheric pressure condition therein;

air supply means provided for in said controlled environment for maintaining a regulated superatmospheric pressure within said lightweight building structure at all times;

motive means being provided for said platform means and causing desired movement of said platform means and said lightweight building structure relative to said moving work site; and

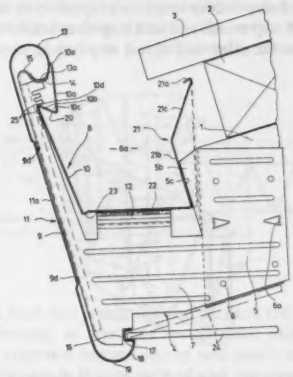
means for controllably adjusting the height-to-width ratio of said lightweight building structure.

## 4,128,974
## FASCIA AND GUTTER SYSTEMS ON BUILDINGS

Harry E. Taylor, Tauranga, New Zealand, assignor to G. W. Taylor Industries Limited, Taurangan, New Zealand

Filed Aug. 2, 1977, Ser. No. 821,065
Int. Cl.[2] E04D *13/00*
U.S. Cl. 52—11 16 Claims

1. A combination fascia and concealed gutter system comprising a plurality of similar support members arranged for securement in substantially horizontal aligned relationship on a support structure below the periphery of a roof of a building, a metal or plastics fascia member shaped and arranged for engagement with said support members when secured, and a gutter channel member into which water from the building roof can flow shaped and arranged for detachable spring fitment within the support members; each support member being shaped to engage and support inner, outer and base parts of the gutter member and being further provided with a lower outer edge portion about which an inturned and upturned lower longitudinal edge portion of the fascia member can locate, and an inset upper edge portion on which an inwardly disposed returned upper edge portion of the fascia member can bear, and the gutter member having an upper outer longitudinal

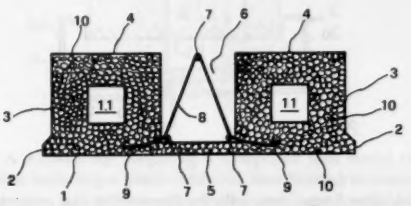


edge portion shaped and arranged to contact said fascia returned upper edge portion.

## 4,128,975
## PREFABRICATED BUILDING COMPONENTS OF EXPANDED MATERIAL AND CEMENT

Giorgio Abate, Modena, Italy, assignor to Solai Vignola di Fabiani Orlando e C. - Societa in nome collettivo, Ancona, Italy

Filed Sep. 7, 1976, Ser. No. 720,749
Claims priority, application Italy, Sep. 5, 1975, 40085 A/75; Dec. 18, 1975, 40132 A/75; Dec. 18, 1975, 40133 A/75; Apr. 8, 1976, 40057 A/76
Int. Cl.[2] E04G *21/00;* E04B *5/19*
U.S. Cl. 52—125 6 Claims




1. A prefabricated building panel formed of a mixture comprising light-weight expanded material, adhesive and cement, said panel comprising at least two longitudinally extending upstanding ribs separated by a channel adapted to be filled with concrete, longitudinally extending reinforcing elements disposed on the bottom of said channel, said reinforcing elements comprising means to enable said panel to be lifted after only brief curing, said means including upwardly projecting stirrup members and outwardly projecting appendices, said outwardly projecting appendices penetrating into the material of said longitudinally extending ribs adjacent the bottoms thereof.

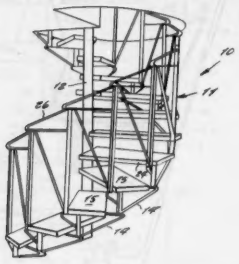
## 4,128,976
## SPIRAL STAIR KIT

Alvin T. Classen, R.R. 4, Andy's Lake, Norfolk, Nebr. 68701

Filed Mar. 8, 1977, Ser. No. 775,680
Int. Cl.[2] E04F *11/00*
U.S. Cl. 52—187 1 Claim

1. A spiral stair kit for constructing a spiral staircase having a plurality of step treads, said kit including a central column, a

set of step-holder brackets adapted to be positioned about said central column and secured to said column, a set of step riser brackets, said step riser brackets adjustable with respect to each other, said step-holder brackets adapted to be secured to one end of said step treads and said step riser brackets adapted to be secured to the other end of said step treads, a set of posts,



said posts having an attached portion defining a bannister segment, said posts adapted to be secured to outer ends of front edges of said step treads and said bannister segment joining other segments to form a banister, connecting braces adapted to secure the assembled staircase in a rigid manner and a quantity of hardware including shims for adjusting the height of said risers for securement of said components together.

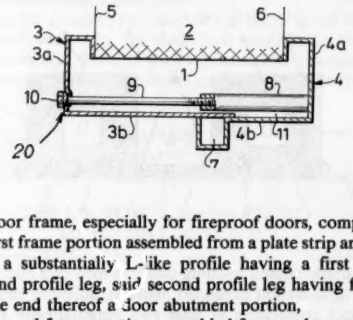
---

**4,128,977**

## DOOR FRAME, ESPECIALLY FOR FIREPROOF DOORS

**Ewald I. E. Schubeis, Tegnergatan 9, S-111-40 Stockholm, Sweden**

**Continuation-in-part of Ser. No. 412,802, Nov. 5, 1973, abandoned. This application Aug. 28, 1975, Ser. No. 608,715**
**Int. Cl.[2] E06B *1/04***
**U.S. Cl. 52—212** **10 Claims**



1. A door frame, especially for fireproof doors, comprising
(a) a first frame portion assembled from a plate strip and bent into a substantially L-like profile having a first and a second profile leg, said second profile leg having formed at the end thereof a door abutment portion,
(b) a second frame portion assembled from a plate strip and bent into a substantially L-like profile having a first and second profile leg,
(c) said first and second frame portions being arranged in a door opening in a wall in such a way that the first profile legs of said frame portions engage the opposite outer surfaces of said wall around said door opening, and said second profile legs of said first and second frame portions extend into said door opening substantially parallel with the edge side thereof and overlap each other within the door opening, said door abutment portion also being overlapped said second profile leg of said first frame portion being outermost,
(d) means for interconnecting said first and second frame portions, said means comprising a plurality of threaded joints, each threaded joint including a fixed rod and a rotatable rod having threads cooperating with threads on said fixed rod, said fixed rod connected at one end thereof to the first profile leg of the first frame portion and being spaced therefrom a distance greater than the thickness of said second profile leg of said second frame portion, and
(e) means for allowing continuous adjustability of the door frame to provide for different wall thickness and to provide for deviations of the parallelism of the outer surfaces of said wall upon suitable selective tightening of said threaded joints, said means including (i) said second profile leg of said second frame portion being movable between the overlapping section of said second profile leg of said first frame portion and said fixed rod in the space therebetween and being able to assume an angle with respect to said fixed rod to adapt to deviations in parallelism of the outer surfaces of said wall, and (ii) said second profile leg of said second frame portion overlapping and being guided by said second profile leg of said first frame portion, and (iii) means for universally swingably mounting each of said rotatable rods in said first profile leg of said second frame portion, said universally swingably mounting means comprising cooperating curved portions of the head of each of said rotatable rods and a depression in said first profile leg of said second frame portion.

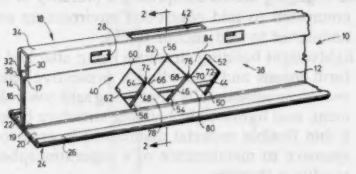
---

**4,128,978**

## CONTROLLED EXPANSION SUSPENDED CEILING GRID BEAM

**John O. Beynon, Waterloo, Canada, assignor to Ceiling & Drywall Products Limited, Toronto, Canada**

**Filed Apr. 11, 1977, Ser. No. 786,427**
**Claims priority, application Canada, Apr. 6, 1977, 275673**
**Int. Cl.[2] E04C *3/04*; E04B *5/52***
**U.S. Cl. 52—232** **5 Claims**



1. A controlled expansion suspended ceiling grid beam for a suspended panel ceiling, said beam having a web with spaced apart marginal edges, a flange having a panel supporting surface provided along one of said marginal edges, a bead provided along the other marginal edge, and an expansion accommodating portion for accommodating thermal expansion at a pre-determined location in said beam, said bead having substantially flat spaced apart sidewalls which lie on apposite sides of the bead axis and which are continuous at least along the upper and lower bead portions and an interconnecting substantially flat top wall, said sidewalls being essentially unconnected at the bead's base, said expansion accommodating portion comprising an arrangement of cut outs for accommodating thermal expansion in the web and longitudinal slot means cut in the beads topwall for essentially disconnecting at the top the bead sidewalls along the length of the said slot means, said cut outs defining three spaced apart notches extending down at least near to said flange to provide areas of bending for a flange portion on beam expansion, said arrangement of cut outs being so configured as to allow the two web portions attached to said flange portion and located between said three spaced apart notches to move with said flange portion as it bends, a control means for controlling initial movement of said flange portion at the beginning of thermal expansion in said beam, said control means comprising web elements connected to said web portions on each side of the central notch, said web elements being adapted to resist both separation of and upward movement of said web portions at the beginning of thermal expansion in said beam, the arrangement being such that thermal expansion in said beam is accommodated by a downward folding of said flange portion initiated by virtue of the movement restraint

placed on said web portions by said web elements and said spaced apart bead sidewalls by virtue of their being essentially unconnected at the top and bottom and lying on opposite sides of the bead's axis buckling laterally outwardly away from each other without interference from the movement of said web portions, said expansion accommodating portion controlling the direction of folding in said flange portion and controlling movement of the beam portions at opposite ends of the slot means to cause said bead portions to move towards each other while maintaining bead and beam alignment and hence flange alignment apart from the downwardly folding flange portion.

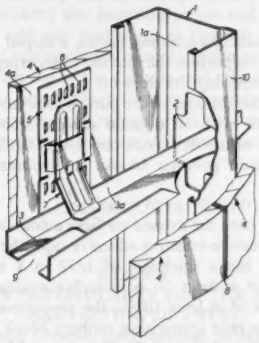
---

**4,128,979**

## SUSPENSION ASSEMBLY FOR PARTITION PANEL

**Reginald S. Price, 3228 - 6th St. SW., Calgary, Alberta, Canada (T2S 2M3)**

**Filed May 26, 1977, Ser. No. 800,750**
**Int. Cl.[2] E04H *1/00*; A43B *23/20***
**U.S. Cl. 52—241** **13 Claims**



1. A suspension assembly for suspending a gypsum board panel from a support member of a support structure, said suspension assembly comprising:

a plate having upper and lower portions, means defining a transverse line of weakness between the upper and lower portions so that the plate preferentially bends along the line, and a plurality of panel-piercing members extending outwardly from one face of the plate; and

a suspension clip, said clip having an upper portion attached to the plate above the line of weakness and said clip having a lower portion defining a cam surface arranged to engage over the support member, whereby when the panel is suspended from the structure the load applied between the clip and the plate causes the lower plate portion to bend about said line of weakness in a sense to incline the panel-piercing members of the lower plate portion in an upwards direction.

---

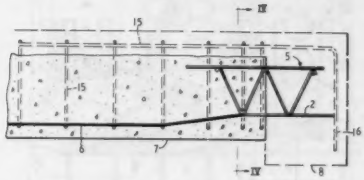
**4,128,980**

## REINFORCED CONCRETE CONSTRUCTION

**Nessib Abdallah, Forestville, Australia, assignor to Civil & Civic Pty. Limited, Sidney, Australia**

**Filed Jun. 7, 1977, Ser. No. 804,276**
**Claims priority, application Australia, Jun. 11, 1976, 6236/76**
**Int. Cl.[2] E04B *1/20***
**U.S. Cl. 52—251** **9 Claims**

1. A reinforced concrete member in a concrete construction, said concrete member extending horizontally in said construction and including: metal reinforcing means extending along substantially the length thereof an elongated partially trussed device with one end embedded in one end of said concrete member and encased in the concrete of said member; the other end of said device extending substantially horizontally from said concrete member for inclusion within a substantially vertical portion of concrete construction, said horizontal concrete member abutting said vertical portion abut said concrete member at a vertical surface at the time of casting said portion from concrete, said portion extending horizontally immediately only above said member; said device comprising a pair of spaced rods and a zig-zag truss member with welds interconnecting said rods so as to form a rigid partially trussed framework



having at least two triangular panels, each rod having a part thereof forming at least one device side; said rods having sufficient extension beyond one of said panels to provide adequate anchorage in the concrete of said concrete member; said device transferring shear and associated forces from the concrete of said concrete member to vertically abutting concrete of said portion of the concrete construction.

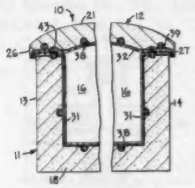
---

**4,128,981**

## BURIAL VAULT

**Bernard T. Juba, White Bear Lake, Minn., assignor to H.B. Fuller Company, St. Paul, Minn.**

**Filed Feb. 22, 1977, Ser. No. 770,633**
**Int. Cl.[2] E04B *13/00***
**U.S. Cl. 52—309.3** **12 Claims**



1. A method for preparing a composite wall burial vault member including a plastic resinous liner bonded to concrete wall means, said method comprising: applying a contact adhesive layer to one side of a plastic resinous vault liner, said contact adhesive being a polychloroprene adhesive, drying said adhesive to the touch, disposing said plastic resinous liner in a form retaining mold, said plastic liner being disposed with the contact adhesive layer facing away from said mold; pouring wet settable concrete in said mold, said concrete engaging said adhesives and setting and curing said concrete.

---

**4,128,982**

## MEANS AND METHOD OF TILED SURFACE CONSTRUCTION

**Daniel E. Weaver, 717 Salem Ct., San Diego, Calif. 92109**

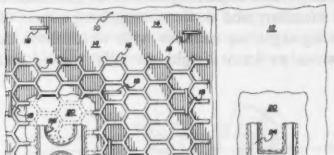
**Filed Dec. 9, 1977, Ser. No. 859,038**
**Int. Cl.[2] E04F *13/08***
**U.S. Cl. 52—367** **11 Claims**

1. A synthetic float strip for floating a setting bed on a structural surface for a tile wall, said strip comprising:

(a) an elongated flat body;

(b) said body having a plurality of openings passing through the thickness to permit exposed surfacedefining mortar in said openings to contact said structural surface;

(c) said body having a substantially smooth, flat front surface to serve as a guide for screeding board; and



(d) at least a portion of the perimeter of said body being bevelled to provide a positive purchase for screeded mortar.

---

**4,128,983**

## PANEL CONNECTOR ASSEMBLY

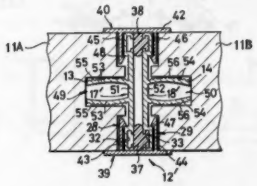
**Isamu Matsubara, Nyuzen, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan**

**Filed Oct. 25, 1977, Ser. No. 844,910**

**Claims priority, application Japan, Oct. 30, 1976, 51-146376[U]**

**Int. Cl.[2] E04C *3/06***

**U.S. Cl. 52—731** **6 Claims**



1. A connector assembly for connecting two panels edge-to-edge with a joint-opening therebetween, each of the panels having a prefinished groove extending longitudinally along such edge thereof, said connector assembly comprising:

(a) a pair of oppositely disposed, elongated first and second members having first and second plug means adapted to be slidably inserted in and secured to the panels along their respective prefinished panel grooves;

(b) a pair of opposed spaced-apart first and second front arm means adapted to be disposed adjacent to one face of the joint-opening, and carried by said first and second members along their respective front longitudinal edges;

(c) a pair of opposed spaced-apart first and second rear arm means adapted to be disposed adjacent to the opposite face of the joint-opening, and carried by said first and second members along their respective rear longitudinal edges; and

(d) a pair of elongated front and rear third members for covering the joint opening on opposite faces, and each having portions for projecting into said joint opening and holding said pair of front arm means and said pair of rear arm means, respectively, whereby said first and second members are secured to each other in spaced-apart relation.

**4,128,984**

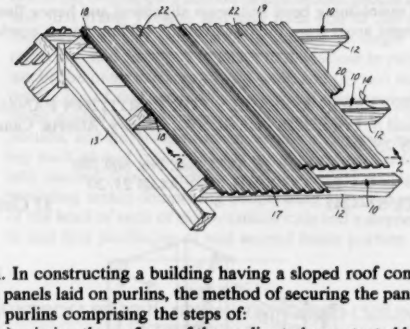
## METHOD OF CONSTRUCTING A SLOPED ROOF

**Robert R. Charbonneau, Lake Elmo, and Robert M. Spatafore, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Filed Jan. 18, 1978, Ser. No. 870,274**

**Int. Cl.[2] E04D *3/24***

**U.S. Cl. 52—746** **5 Claims**



1. In constructing a building having a sloped roof comprising panels laid on purlins, the method of securing the panels to the purlins comprising the steps of:

(a) priming the surfaces of the purlins to be contacted by the roof panels with an organic solvent solution or stable dispersion of rubbery block copolymer of elastomeric and thermoplastic polymer blocks and compatible tackifier resin,

(b) allowing the solvent to volatilize,

(c) applying onto the primed surfaces a double-coated foam-backed pressure-sensitive adhesive tape, the foam backing of which has a thickness of 1/32 to ¼ inch, a tensile strength of at least 50 pounds per square inch and an elongation of at least 100%, the pressure-sensitive adhesive of the tape comprising rubbery block copolymer of elastomeric and thermoplastic polymer blocks and compatible tackifier resin and having a disposable low-adhesion web protecting the outer surface of the tape,

(d) after the purlins are positioned in the building, peeling away the low-adhesion web and,

(e) laying the roof panels against the exposed surface of the pressure-sensitive adhesive tape.

---

**4,128,985**

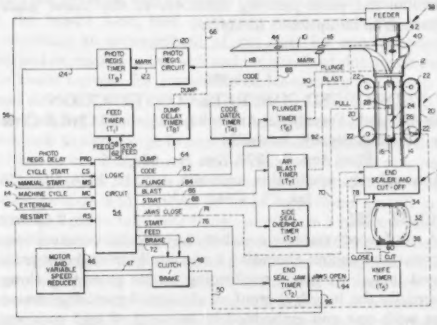
## CONTROL SYSTEM FOR PACKAGE MAKING MACHINE

**Charles J. Simmons, East Longmeadow, Mass., assignor to Package Machinery Company, East Longmeadow, Mass.**

**Filed Oct. 31, 1977, Ser. No. 846,820**

**Int. Cl.[2] B65B *57/16, 9/10***

**U.S. Cl. 53—51** **29 Claims**



1. In a machine for making packages by transversely sealing a tube of packaging material at spaced lines along its length, the combination comprising means providing a tube of packag-

ing material, an end sealer with operative and inoperative conditions for flattening, during the former condition, said tube along a zone extending transversely thereof and for sealing opposite flattened sides to one another along said zone, a tube feeder for moving said tube longitudinally of itself past said end sealer, said feeder having powered and non-powered modes for feeding, during the former mode, said tube from alignment of one transverse seal zone with said end sealer to alignment of the next such transverse seal zone with the end sealer, means for producing time spaced bag making cycle start signals, on demand control circuitry operable in response to each appearance of a cycle start signal irrespective of the time interval between signals to generate a feed signal and a delayed stop feed signal, said control circuitry responsive to said feed signal for controlling the operation of said tube feeder so that at the start of said feed signal said feeder is shifted from its non-powered to its powered mode and on receipt of said stop feed signal said feeder is shifted from its powered to its non-powered mode, said control circuitry also being operable responsive to said stop feed signal to generate a seal signal, and said control circuitry also including an end seal timer operable responsive to said stop feed signal to generate a delayed stop seal signal and having manually operable means for selectively varying the duration of the delay in said stop seal signal, said end sealer thus being shifted from its inoperative condition to its operative condition on receipt of said seal signal and subsequently back to its inoperative condition on receipt of said stop seal signal.

---

**4,128,986**

## APPARATUS PARTICULARLY FOR THE AUTOMATIC HARVESTING OF FRUIT

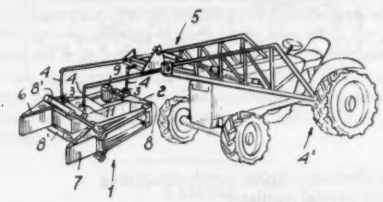
**Mario Santarelli, Livorno, Italy, assignor to Harvester Center Italiana S.r.l., Piazzetta Guastalla, Italy**

**Filed Feb. 25, 1977, Ser. No. 772,175**

**Claims priority, application Italy, Mar. 29, 1976, 21685 A/76; Apr. 30, 1976, 22859 A/76**

**Int. Cl.[2] A01D** *46/00*

**U.S. Cl. 56—328 TS** **10 Claims**



1. A tree shaking apparatus for automatically harvesting fruit including a frame, clamping jaws on said frame, eccentric mass assemblies rotatably mounted on said frame and driving means for imparting rotation to said eccentric mass assemblies, characterized in that it comprises at least one first rotating mass assembly rotatably mounted on said frame, first motor means supported on said frame, first transmission means in said frame for transmitting variable rotatory motor from said first motor means to said first eccentric mass assembly, at least a second eccentric mass assembly rotatably mounted on said frame independently from said first eccentric mass, a second motor means supported on said frame and second transmission means in said frame for transmitting variable rotatory motion from said second motor means to said second eccentric mass assembly independently from the rotation of said first eccentric mass and selectively variable both in direction and intensity.

**4,128,987**

## AGRICULTURAL IMPLEMENTS

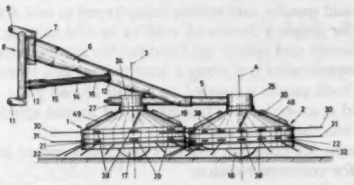
**Petrus W. Zweegers, Nieuwendyk 46, Geldrop, Netherlands**

**Filed Nov. 24, 1976, Ser. No. 744,596**

**Claims priority, application Austria, Nov. 8, 1976, 8266/76**

**Int. Cl.[2] A01D** *77/06*

**U.S. Cl. 56—377** **23 Claims**



1. A haymaking machine comprising one or more rotors rotatable about upright axes of rotation, a plurality of tine groups distributed about the circumference of each rotor, each tine group comprising a plurality of superposed tines extending outwardly with respect to the axis of rotation of the rotor, said tines in each tine group comprising a first tine having a fixed mounting on the rotor in the working position and a second tine at a level lower than said first tine, and means on said rotor for pivotally mounting said second tine on a pivot axis near the circumference of the rotor and extending substantially tangentially to a circle having its center on the axis of rotation of the rotor.

---

**4,128,988**

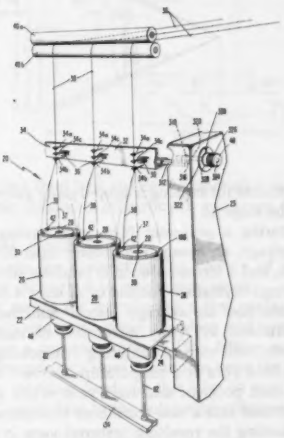
## APPARATUS FOR TWISTING AND WINDING STRAND MATERIAL

**Ralph L. Ragan, 82 Sheridan Dr., NE., Atlanta, Ga. 30305**

**Filed Oct. 8, 1976, Ser. No. 731,093**

**Int. Cl.[2] D01H** *1/26, 1/00, 7/02*

**U.S. Cl. 57—66** **25 Claims**



1. An apparatus for twisting and winding strand by feeding the strand substantially axially onto a rotating strand receiver, comprising:

a spindle, said receiver being removably secured to said spindle;

drive means for rotating said receiver;

strand hook means for guiding the strand onto said receiver;

means for rotating said hook means concentrically to said receiver;

means for imparting axial relative movement between said

hook means and said receiver during rotation of said receiver;
means for controlling a differential between the speeds of rotation, respectively, of said guide means and said receiver as a function of the tension of the strand being wound onto said receiver;
said strand receiver comprising a bobbin, and said drive means including a drive member rotatably mounted about said spindle, said bobbin being keyed to said drive member for rotation therewith relative to said spindle;
wherein said spindle and said bobbin are mounted within an open-ended pot along a longitudinal axis thereof and said hook means is located on a wall of said pot;
said open-ended pot being coupled to said spindle for rotation therewith; and
means for coupling together said hook means and said pot for common rotation;
said drive member including a hub located beneath said bobbin;
wherein a wall of said pot includes a longitudinal channel, said coupling means including strip means slidably engaged in said channel and carrying said hook means; and
said means for imparting axial relative movement between said strip means and said receiver includes means for moving said strip means within said channel during rotation of said pot.

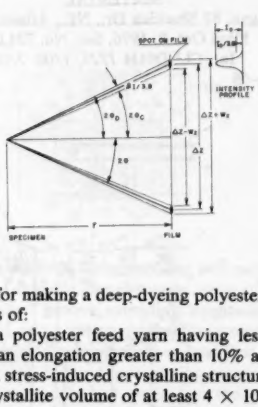
---

**4,128,989**

## DEEP-DYEING POLYESTER SPINNING PROCESS

**James E. Bromley; Wayne T. Mowe, and Frank Stutz, all of Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.**

**Filed Apr. 4, 1977, Ser. No. 784,408**
**Int. Cl.[2] D02G *1/02, 3/02***
**U.S. Cl. 57—247** **9 Claims**




1. A process for making a deep-dyeing polyester yarn, comprising the steps of:
a. texturing a polyester feed yarn having less than 30% shrinkage, an elongation greater than 10% and less than 80%, and a stress-induced crystalline structure having an average crystallite volume of at least $4 \times 10^5$ cubic angstroms and an average lateral minimum dimension as determined by X-ray diffraction of more than 45 angstroms, said step of texturing comprising heat-setting of said feed yarn at a temperature above 170° C. and below the melt point of said feed yarn while said feed yarn is deformed into a non-rectilinear configuration, and
b. collecting the resulting textured yarn in an orderly fashion.

---

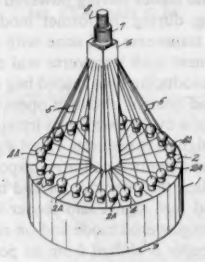
**4,128,990**

## MULTIPLE PURPOSE TEACHING DEVICE

**Velma L. Phillips, Star Rte. Box 194, Chemult, Oreg. 97731**

**Filed Jul. 20, 1977, Ser. No. 817,370**
**Int. Cl.[2] G04B *45/00***
**U.S. Cl. 58—2** **4 Claims**

1. A teaching device for instructing individuals in the identification of colors and in telling of time, said device comprising,
a base having an upper surface with different colored areas thereon,
a series of pegs insertable into said base,
a centrally disposed post supported by said base,
means tethering each of said pegs to said post,



said base having a clock face on its underside,
an hour and a minute hand in said base, and
controls rotatably mounted within said post with each control having a clock hand attached to its lower end.

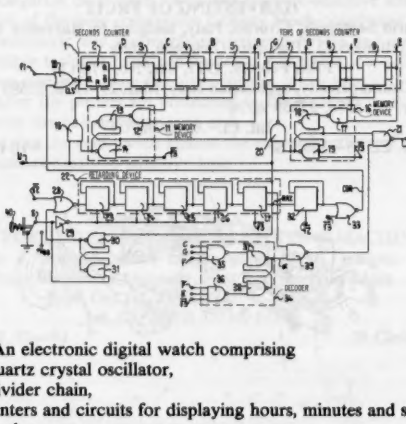
---

**4,128,991**

## ELECTRONIC DIGITAL WATCH

**Jean-Claude Robert-Grandpierre, Colombier, Switzerland, assignor to Ebauches SA, Neuchatel, Switzerland**

**Filed Dec. 20, 1976, Ser. No. 752,430**
**Claims priority, application Switzerland, Jan. 12, 1976, 263/76**
**Int. Cl.[2] G04C *3/00***
**U.S. Cl. 58—23 R** **4 Claims**




1. An electronic digital watch comprising
a quartz crystal oscillator,
a divider chain,
counters and circuits for displaying hours, minutes and seconds,
and a means for correcting the counters for the minutes and seconds when the difference between the indicated time and the actual time is not more than plus or minus 30 seconds, said correcting means comprising,
a push button,
a first logic circuit,
a time delay circuit which is activated by the operation of said push button and which produces an output signal only if the said push button is actuated until the end of the time delay period, the said output signal being delivered via said first logic circuit to the seconds counters to put said seconds counters into a state corresponding to the actual time at the end of said time delay operation, and
a second logic circuit for determining when the watch is slow and for delivering a correcting pulse to the min-

utes counter, the outputs of said seconds counters being inputted to said second logic circuit, said second logic circuit delivering said correcting pulse to the minutes counter at the end of the time delay operation.

---

**4,128,992**

## ROCKING MOTOR FOR LOW COST QUARTZ WATCH

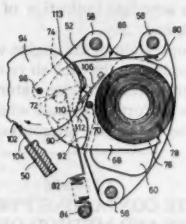
**Joseph Egger, Pforzheim; Franz Mayer, Birkenfeld; Herbert Schwartz, Wurmberg; Walter Sodler, Pforzheim-Buchenbronn, all of Fed. Rep. of Germany; Jean Suard, Besancon, France, and Wilhelm Tilse, Birkenfeld, Fed. Rep. of Germany, assignors to Timex Corporation, Waterbury, Conn.**

**Filed Mar. 21, 1977, Ser. No. 779,652**

**Claims priority, application Fed. Rep. of Germany, Apr. 17, 1976, 2617077**

**Int. Cl.² G04C *3/00***

**U.S. Cl. 58—23 D** **14 Claims**



1. In a quartz controlled analog wrist watch comprising a quartz controlled pulse generator and a driving element for driving a first toothed wheel of a gear train, said driving element being mounted for pivoting about an axis, a coil connected to receive the output pulses of the pulse generator, and a permanent magnet, said coil and said magnet being moveable relative to each other, for deflecting said driving element from a rest position, and further comprising a reset spring for returning the driving element to said rest position, the improvement comprising:

means causing the output pulses from the pulse generator to occur substantially less frequently than once per second, and means for directly indexing the first toothed wheel by said driving element in such a way that when the driving element is deflected, the reset string is tensioned and only when the driving element is returning under tension of said reset spring is the first toothed wheel indexed, said first toothed wheel being disposed to serve as the "center" wheel.

---

**4,128,993**

## ZERO ADJUSTMENT IN AN ELECTRONIC TIMEPIECE

**Hidetoshi Maeda, Tenri; Mitsuo Morihisa, Nara, and Takehiko Sasaki, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Aug. 15, 1975, Ser. No. 605,080**

**Claims priority, application Japan, Aug. 15, 1974, 49-94081**

**Int. Cl.² G04C *3/00***

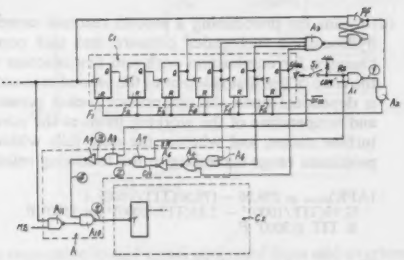
**U.S. Cl. 58—23 R** **2 Claims**

1. In an electronic time piece which comprises a time information calculation circuit including second and minute counters and a zero adjustment control circuit, the improvement comprising:

a zero adjustment command switch;

a determination circuit responsive to the condition of said second counter of said time information calculation circuit for determining whether in a given 60 second interval of from zero to 59 seconds, the second count has a value between zero seconds and a predetermined value less than 30 second representative of a characteristic boundary between fast and slow error conditions of said timepiece; and

an increment signal generation circuit selectively driving said minute counter to increment by one the count therein



in response to depression of said zero adjustment command switch coincident with a determination by said determination circuit that said second count is between said characteristic boundary value and 59 seconds.

---

**4,128,994**

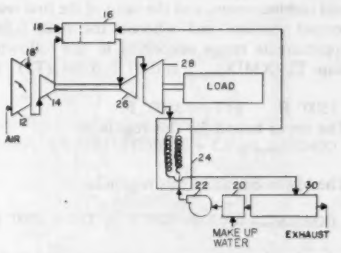
## REGENERATIVE PARALLEL COMPOUND DUAL-FLUID HEAT ENGINE

**Dah Y. Cheng, Palo Alto, Calif., assignor to International Power Technology, Inc., Sunnyvale, Calif.**

**Continuation-in-part of Ser. No. 534,479, Dec. 19, 1974, Pat. No. 3,978,661. This application Jul. 14, 1976, Ser. No. 705,355**

**Int. Cl.² F02C *7/00, 7/10***

**U.S. Cl. 60—39.05** **23 Claims**




1. A dual working fluid heat engine for operation in a range encompassing from maximum efficiency to maximum throughput comprising:

(a) a combustion chamber;

(b) turbine means for converting the energy of working fluids passing through it to mechanical work;

(c) compressor means for introducing a first reactant comprising air into said combustion chamber, said compressor means having a pressure ratio (CPR) falling within an approximate region of values dependent upon the temperature of the working fluids at the inlet to said turbine means (TIT) according to the following relationship:

$$(CPR)_{mean} \cong -21.25 + 21.14(TIT/1000) + 3(TIT/1000)^2 - 1.667(TIT/1000)^3$$

for 1500° F. ≦ TIT ≦ 3000° F.

The upper bound of this region is:

$$(CPR)_{upper1} \cong (CPR)_{mean} \times 1.5 \text{ for } 1500° \text{ F.} \leq TIT < 1600° \text{ F.}$$

$$(CPR)_{upper2} \cong (CPR)_{mean} \times 1.4 \text{ for } 1600° \text{ F.} \leq TIT < 2200° \text{ F.}$$

$$(CPR)_{upper3} \cong (CPR)_{mean} \times 1.3 \text{ for } 2200° \text{ F.} \leq TIT < 3000° \text{ F.}$$

The lower bound of this region is:
$(CPR)_{lower_1} \cong 4.0$ for 1500° F. $\leqq$ TIT $<$2000° F.

$(CPR)_{lower_2} \cong (CPR)_{mean}/1.4$ for 2000° F. $\leqq$ TIT $<$ 3000° F.

(d) means for introducing a second reactant comprising a hydrocarbon fuel under pressure into said combustion chamber for combustion with said first reactant wherein the ratio of the first raactant to the second reactant (AFR) is dependent upon the compressor means pressure ratio and temperature of the working fluids at the inlet to said turbine means, and wherein the ratio falls within an approximate range according to the following relationship:

$(AFR)_{mean} \cong 209.96 - 170.90(TIT/1000) + 52.93(TIT/1000)^2 - 5.81(TIT/1000)^3$ for 1500° F. $\leqq$ TIT $\leqq$3000° F.

The upper bound of this region is:
$(AFR)_{upper_1} \cong (AFR)_{mean} \times 1.4$ for 1500° F. $\leqq$ TIT $\leqq$3000° F.

The lower bound of this region is:

$(AFR)_{lower_1} \cong (AFR)_{mean}/1.4$ for 1500° F. $\leqq$ TIT $<$ 2000° F.

$(AFR)_{lower_2} \cong (AFR)_{mean}/1.5$ for 2000° F. $\leqq$ TIT $\leqq$ 2500° F.

$(AFR)_{lower_3} \cong 15.0$ for 2500° F. $\leqq$ TIT $\leqq$ 3000° F.

(e) means of introducing a fluid comprising water in a vapor state into the said heat engine combustion chamber at a ratio of water to the combustion products by weight (XMIX) dependent upon the compressor means pressure ratio, the temperature of the working fluids at the inlet to said turbine means, and the ratio of the first reactant to the second reactant and wherein the ratio falls within an approximate range according to the following relationship: Ti, $(XMIX)_{mean} \cong 0.20 + 0.0643(TIT/1500)$

for 1500° F. TIT 3500° F.
The upper bound for this region is:
$(XMIX)_{upper} \cong 0.3 + .0167(TIT/1500° F.)$

The lower bound of this region is:

$(XMIX)_{lower_1} \cong 0.1$ for 1500° F. $<$ TIT $<$ 3500° F.

whereby the said vapor is further heated by heat transfer through rapid and turbulent mixing with the heated combustion products;

(f) means fo utilizing part of the mechanical work generated by said expander means to power said compressor means;

(g) means for extracting useful work from said expander means; and

(h) means for transferring residual thermal energy from said mixture of vapor and combustion products to said water to thereby preheat the same to a super-heated vapor, XMIX being chosen to generally maximize the temperature of the superheated water vapor in degrees of superheat, for a given value of TIT, and wherein the CPR is chosen to generally maximize the transfer of the residual thermal energy to said water for a given value of TIT.

---

**4,128,995**

## METHOD AND APPARATUS FOR STABILIZING AN AUGMENTER SYSTEM

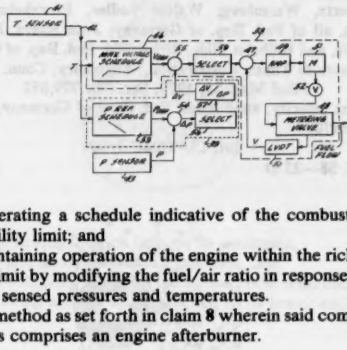
**Peter D. Toot, West Chester, Ohio, assignor to General Electric Company, Cincinnati, Ohio**

**Filed Oct. 18, 1976, Ser. No. 733,093**
**Int. Cl.[2] F02K** *3/06, 3/08;* **F02C** *9/08*
**U.S. Cl. 60—204** **23 Claims**

**8.** A method of stabilizing a fuel control system of the type which schedules the fuel/air ratio to a combustion apparatus in response to certain engine operating parameters, comprising the steps of:

a. sensing pressures representative of the air pressure in the combustor;

b. sensing temperatures representative of the air temperatures in said combustor;



c. generating a schedule indicative of the combustor rich stability limit; and

d. maintaining operation of the engine within the rich stability limit by modifying the fuel/air ratio in response to both said sensed pressures and temperatures.

**12.** A method as set forth in claim **8** wherein said combustion apparatus comprises an engine afterburner.

---

**4,128,996**

## CHLORITE CONTAINING PYROTECHNIC COMPOSITION AND METHOD OF INFLATING AN INFLATABLE AUTOMOBILE SAFETY RESTRAINT

**Eugene F. Garner, and Brian K. Hamilton, both of Canyon Country, Calif., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.**

**Filed Dec. 5, 1977, Ser. No. 856,958**
**Int. Cl.[2] C06D** *5/06;* **C06B** *45/10*
**U.S. Cl. 60—205** **10 Claims**

**1.** A pyrotechnic composition comprising:

from about 1 to 20% by weight of a thermoplastic resin selected from the group consisting of polyacetal resins, polyvinyl acetate resins and mixtures thereof;

from about 30 to 80% by weight of an alkali metal chlorite; and

from about 20 to 60% by weight of a coolant selected from the group consisting of calcium hydroxide, magnesium hydroxide or mixtures thereof.

**6.** A method of inflating an inflatable automobile safety restraint comprising the step of substantially completely inflating the restraint with the gaseous composition products of combustion of a composition comprising:

about 1 to 20% by weight of a thermoplastic resin selected from the group consisting of polyacetal resins, polyvinyl acetate resins and mixtures thereof;

about 30 to 80% by weight of an alkali metal chlorite; and

about 20 to 60% by weight of a coolant selected from the group consisting of calcium hydroxide, magnesium hydroxide or mixtures thereof.

---

**4,128,997**

## I.C.E. EQUIPPED WITH MEANS FOR MAINTAINING REACTOR TEMPERATURE ABOUT A SINGLE TEMPERATURE

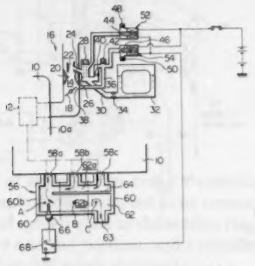
**Suzuo Suzuki, Yokosuka; Masayasu Nakajima, Yokohoma; Ken-ichi Koizumi, Yokosuka, and Yoshio Ookubo, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Japan**

**Filed Sep. 28, 1976, Ser. No. 727,455**
**Claims priority, application Japan, Sep. 29, 1975, 50-117556**
**Int. Cl.[2] F02B** *75/10;* **F01N** *3/10, 7/10*
**U.S. Cl. 60—274** **13 Claims**

**1.** A method of controlling the temperature in a reactor for oxidizing the unburned constituents contained in the exhaust

gases discharged from an internal combustion engine, said reactor defining therein a reactor chamber including a first portion to which the exhaust gases from the engine are introduced, a second portion downstream of the first portion, and a third portion downstream of the second portion, through which third portion oxidized exhaust gases are discharged out of the reactor, said method comprising the steps of:

sensing a temperature at a location including the first and second portions of the reactor, comparing the sensed temperature with a predetermined temperature which predetermined temperature is obtained when the temperature in the third portion of the reactor is within a first temperature range where the unburned constituents contained in the exhaust gases introduced from the combustion chamber of the engine are effectively thermally oxidized, said predetermined temperature being in close



proximity to and higher than a temperature at said location which temperature is obtained immediately before the temperature in the third portion falls below the first temperature range;

supplying the combustion chamber of the engine with a first air-fuel mixture having a first air-fuel ratio which causes the temperature of the exhaust gases throughout the reactor to rise into the first temperature range, when the temperature of said location is below said predetermined temperature; and

supplying the combustion chamber of the engine with a second air-fuel mixture having a second air-fuel ratio which causes the temperature of the exhaust gases throughout the reactor to fall into a second temperature range where the unburned constituents contained in the exhaust gases are not oxidized, when the temperature of said location exceeds said predetermined temperature.

---

**4,128,998**

## OVERHEAT PREVENTING SYSTEM FOR EXHAUST GAS PURIFIER OF VEHICLES

**Tadashi Hattori, Nishio; Takamichi Nakase, Gamagori; Hideo Tsubouchi, and Toshiharu Iwata, both of Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan**

**Division of Ser. No. 371,880, Jun. 20, 1973, Pat. No. 4,012,906. This application Feb. 2, 1977, Ser. No. 764,985**

**Claims priority, application Japan, Jun. 26, 1972, 47-63896; Jul. 26, 1972, 47-75399; Jul. 26, 1972, 47-75400; Jul. 26, 1972, 47-75401; Jul. 31, 1972, 47-77155**

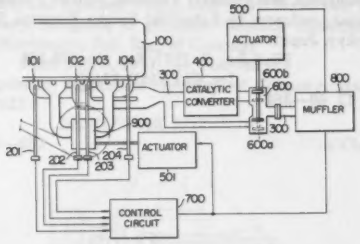
**Int. Cl.² F01N *3/15***

**U.S. Cl. 60—277** **16 Claims**

1. An overheat preventing system for exhaust gas purifier of a vehicle comprising:

a temperature detector inserted in the locality of each of a plurality of engine exhaust ports;

an overheat detector means for detecting failure of an engine to fire from signals from said temperature detectors to produce a signal, said overheat detector means detecting the time rate of change of the temperature in the locality of said engine exhaust ports, whereby when said temperature change rate reaches a predetermined value, the occurrence of a misfire is detected to generate an overheat signal; and




means responsive to said signal generated from said overheat detector means to prevent unburned gases from flowing into an exhaust gas purifier.

---

**4,128,999**

## HYDRAULIC TORQUE CONVERTER WITH A LOCK-UP CLUTCH AND AN AXIALLY RETRACTABLE REACTOR

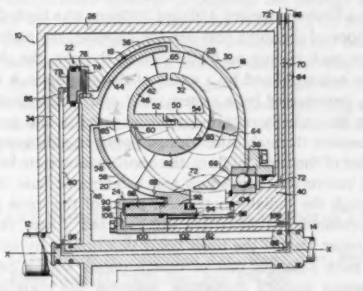
**Akinori Yokoyama, Yokohama, and Iwao Morinaka, Tokyo, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan**

**Filed Nov. 23, 1977, Ser. No. 854,100**

**Claims priority, application Japan, Nov. 24, 1977, 52-156377[U]**

**Int. Cl.² F16D *33/04***

**U.S. Cl. 60—347** **6 Claims**



1. A torque converter capable of selectively providing a fluid connection and a rigid mechanical connection between input and output means for power transmission, comprising in combination:

an impeller member connected to and driven by the input means;

a turbine member disposed opposite to the impeller member and adapted to be driven by the latter through the medium of the fluid, the turbine member being connected to the output means;

a reactor member movable axially of the torque converter between a working and a retracted position, the reactor member when in the working position being effective to redirect the fluid flowing out of the turbine member back into the impeller member to boost the action of the latter;

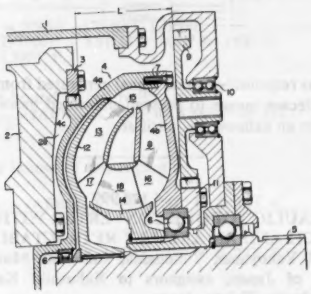
a lock-up clutch for selectively providing the mechanical connection between the input and the output means; and

actuator means for moving the reactor member from the working to the retracted position in order to minimize power loss incurred by the fluid when the input and the output means are coupled by the lock-up clutch.

## 4,129,000
## HYDRAULIC TORQUE CONVERTER

Haruhiko Umeda, Yokohama; Ryuji Ito, Ebina; Akinori Yokoyama, and Mitsuaki Komatsu, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jun. 9, 1977, Ser. No. 805,155
Int. Cl.[2] F16D *33/20*
U.S. Cl. 60—361 2 Claims



1. A hydraulic torque converter having a torus provided with a bladed impeller, a bladed turbine and a bladed stator, the portions of the torus between the impeller, the turbine and the stator each having no blade formed thereon, the shape of the torus being defined by a series of design points A to J, inclusive, determined by a system of X and Y coodinates starting from the radially outermost design point A and processing in succession through other design points in a direction opposite to that of the toroidal flow, the coordinate system being related to a converter output axis and a reference base line passing through the radially outermost point of the torus and drawn perpendicular to the output axis as X and Y axes, respectively, the outer wall of the torus being determined by interconnecting each adjacent pair of design points with a continuously changing smooth curvature, wherein the coordinates have values for design points A to J as follows:

A (0, 1.000 R)

B [(0.1225 ± 0.0123)R, 0.9335 R]

C [(0.1615 ± 0.0162)R, 0.7225 R]

D [(0.1590 ± 0.0159)R, 0.5065 R]

E [(0.0175 ± 0.0018)R, 0.3650 R]

F [− (0.1100 ± 0.0110)R, 0.3515 R]

G [− (0.2570 ± 0.0257)R, 0.4040 R]

H [ − (0.3285 ± 0.0329)R, 0.5060 R]

I [− (0.2990 ± 0.0299)R, 0.7470 R]

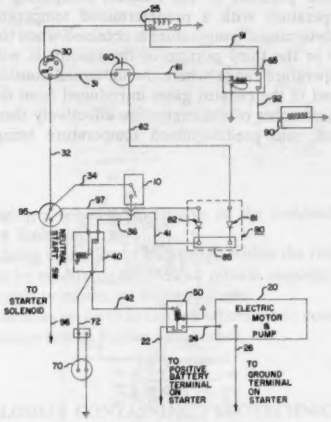
J [− (0.1340 ± 0.0134)R, 0.9385 R]

wherein R is the outermost radius of the torus, positive and negative values being measured in opposite directions, respectively, from the reference base line.

## 4,129,001
## ENGINE AIR HEATER AND STARTING CIRCUITS TO BY-PASS AUXILIARY STEERING CIRCUIT

Carl A. Keyzer, Mundelein, Ill., assignor to Fiat-Allis Construction Machinery, Inc., Deerfield, Ill.

Filed Nov. 25, 1977, Ser. No. 854,808
Int. Cl.[2] F15B *20/00, 21/08*
U.S. Cl. 60—403 8 Claims




1. In a vehicle having a vehicle engine driven hydraulic pump for supplying hydraulic fluid to a vehicle steering system, a vehicle battery driven auxiliary hydraulic pump for supplying hydraulic fluid to the vehicle steering system upon a predetermined decrease in hydraulic fluid supplied from said vehicle engine driven pump, auxiliary pump actuating means for coupling the vehicle battery driven auxiliary hydraulic pump to the vehicle battery in response to the occurrence of a predetermined decrease in hydraulic fluid supplied from said vehicle engine driven pump, an air heater element for heating intake air prior to vehicle engine starting, and a vehicle ignition system including the auxiliary pump actuating means, a normally open neutral start switch the contacts of which are closed when starting the vehicle and a normally open heater switch for effecting energization of the air heater element for heating the pre-start engine intake air, the improvement comprising

a relay having normally closed relay contacts coupling said vehicle battery driven auxiliary hydraulic pump to the vehicle battery in response to said auxiliary pump actuating means and having a relay winding coupled to said normally open heater switch to open said normally closed relay contacts upon the closing of said normally open heater switch to electrically isolate said vehicle battery driven auxiliary hydraulic pump from the vehicle battery when said heater switch contacts are closed.

---

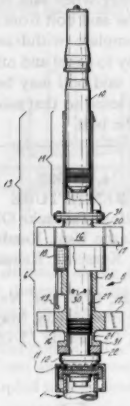
## 4,129,002
## CYLINDER PIECE FOR A PILE DRIVING RAM

Hans G. Schnell, Hamburg, Fed. Rep. of Germany, assignor to Van Kooten B.V., Naarden, Netherlands

Filed Nov. 7, 1975, Ser. No. 629,917
Claims priority, application Netherlands, Nov. 20, 1974, 7415152
The portion of the term of this patent subsequent to Jan. 10, 1995, has been disclaimed.
Int. Cl.[2] F01B *29/08;* B22D *13/02*
U.S. Cl. 60—633 22 Claims

1. In a pile driving device comprising a guide frame having guide stays and a foot for receiving a pile to be driven; a cylinder having interconnected an upper portion and a lower portion; a piston slidable in said cylinder; guide members con-

nected to said cylinder and engaging said guide stays; an impact member slidable in said cylinder; and a bottom ring connected to the lower portion, said bottom ring slidably receiving the impact member; the improvement which comprises



said lower portion of said cylinder being a centrifugally cast alloy steel having end portions adapted to be connected to the upper portion of said cylinder and to the bottom ring, inlet and outlet ports between said end portions, and a plurality of guide girdles for supporting said guide members.

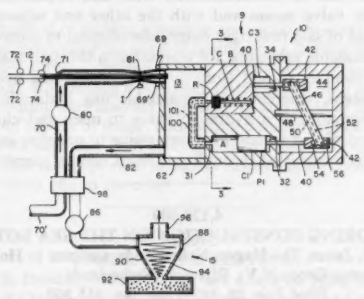
---

**4,129,003**

## ENGINE OPERATED BY A NON-POLLUTING RECYCLABLE FUEL

**E. Quimby Smith, Jr., Camarillo, Calif., assignor to Q Corporation, Troy, Mich.**

**Filed Mar. 29, 1976, Ser. No. 671,280**
**Int. Cl.² F02G *1/00*; F23B *7/00***
**U.S. Cl. 60—645** **16 Claims**



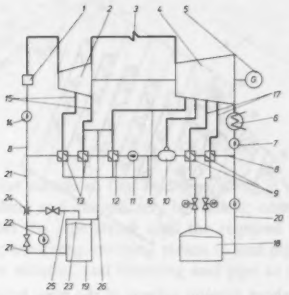
1. A system of operating an external combustion engine which is operated by a heated working fluid of the engine, comprising providing a fuel selected from the group consisting of magnesium, aluminum, magnesium plus aluminum and a magnesium-aluminum alloy, providing a combustion chamber in association with the engine, burning said fuel in said combustion chamber, and subjecting the working fluid of the engine to the heat generated by the burning fuel in said combustion chamber.

**4,129,004**

## METHOD AND APPARATUS FOR THE STORAGE OF ENERGY IN POWER PLANTS

**Franz Thelen, and Henning Weber, both of Mülheim, Fed. Rep. of Germany, assignors to Deutsche Babcock Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany**

**Filed Feb. 4, 1977, Ser. No. 765,803**
**Claims priority, application Fed. Rep. of Germany, Mar. 9, 1976, 2609622**
**Int. Cl.² F01K *3/12, 7/34***
**U.S. Cl. 60—652** **6 Claims**



1. A method for the storage of energy in power plants with a boiler for peak-load coverage comprising the steps of: heating hot water in feed water preheaters; storing the heated water in a hot water storage tank; filling and emptying alternately said storage tank and a tank receiving cold water; holding the stored hot water at feed water temperature and maintaining the temperature uniform throughout the storage tank level; feeding the hot water during peak load directly into a feed water line downstream of the high-pressure water heater preheaters; said hot water storage tank and said tank receiving cold water having substantially the same volume; blocking bleeder lines leading to feed water heaters and supplying said boiler exclusively with hot water from said hot water storage tank during peak-load operation.

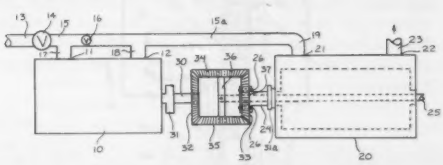
---

**4,129,005**

## MOMENTARY TORQUE MAXIMIZING METHOD AND APPARATUS

**Clarence K. Greene, 100 N. Arlington Ave., Reno, Nev. 89501**

**Filed May 27, 1975, Ser. No. 574,568**
**Int. Cl.² F01B *21/00***
**U.S. Cl. 60—715** **6 Claims**



1. The method of utilizing an expansible fluid for extracting the latent energy therein as mechanical power including: (1) providing a primary source of expansible fluid; (2) passing said expansible fluid into a first expander; (3) passing the expanded fluid from the first expander into a secondary expander; (4) exhausting said secondarily expanded fluid from said secondary expander; (5) coupling the output of the first expander to one element of a differential mechanism; (6) coupling the output from the secondary expander to another element of a differential mechanism wherein the outputs from the primary and secondary expanders will be balanced; (7) coupling a third element of the differential mechanism to a final power takeoff;

and, (8) alternately bypassing the primary fluid from the primary expander directly to the secondary expander.

---

**4,129,006**

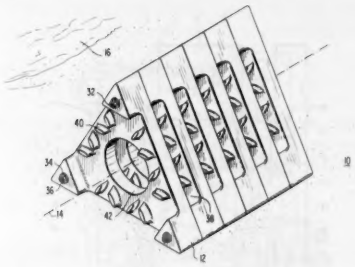
**MODULAR EROSION CONTROL SYSTEM**

**Peter R. Payne, Annapolis, Md., assignor to Sylvia M. Payne, Annapolis, Md., a part interest**

**Filed May 19, 1977, Ser. No. 798,558**

**Int. Cl.[2] E02B *3/06***

**U.S. Cl. 405—31** **9 Claims**



**1.** In a shore erosion system of the type having a series of individual modules joined to form a composite structure, the improvement comprising, each individual module having a substantially symmetrical equilateral triangle outside wall configuration, each module having a wall surface aligned substantially perpendicular to movement of waves, a series of aerodynamically shaped baffles projecting from said wall surface, wherein uniform wave dissipation occurs about any symmetrical outside wall.

---

**4,129,007**

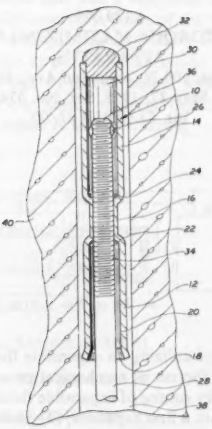
**ANCHOR DEVICE FOR RESIN ANCHOR SYSTEM**

**Paul G. Rausch, Parma, Ohio, assignor to Celtite, Inc., Cleveland, Ohio**

**Filed Aug. 4, 1977, Ser. No. 821,890**

**Int. Cl.[2] E21D *21/00*; F16B *13/00***

**U.S. Cl. 405—261** **10 Claims**



**1.** An anchor for use in a hole with a bolt and cartridge containing hardenable resin, said bolt having a threaded shank and having at least one lug means extending from said threaded shank, said anchor being an elongate cylindrical shell and having a central passage to receive said bolt, to form an anchor-bolt unit, said anchor having a first open end and a second closed end, said bolt extending outwardly of said first open end, said anchor also having an internally threaded portion for receiving said bolt, said bolt lug means being located adjacent said closed second end of said anchor, said anchor-bolt unit being inserted in said hole and said cartridge also being inserted in said hole whereby when said bolt is rotated in a first sense to tend to withdraw said bolt from said anchor, said bolt lug means prevents complete withdrawal and instead said anchor is rotated, thereby to expel and mix the contents of said cartridge and thereafter said bolt may be rotated after setting of the resin in a second sense so that said bolt penetrates into said anchor to tension the bolt.

---

**4,129,008**

**TREMIE TUBE**

**Yasushi Nakahara, Hackioji; Tadasuke Ohtomo, Hino; Shinichi Yokota, Chofu, and Kazuo Usui, Kamisumachi, all of Japan, assignors to Kajima Kensetsu Kabushiki Kaisha, Tokyo, Japan**

**Filed May 25, 1976, Ser. No. 689,690**

**Claims priority, application Japan, May 28, 1975, 50-64688**

**Int. Cl.[2] E02D *15/06***

**U.S. Cl. 405—303** **1 Claim**

**1.** A tremie tube comprising: a first rigid outer tube having an enlarged lower end; a second water impervious, pressure yieldable inner tube secured within said outer tube; a pressure responsive closure means secured to the lower end of said inner tube; means to pressure actuate said closure means; said pressure responsive closure means including an expandable bag hydraulic valve means positioned within said enlarged portion of the lower end of said first outer tube; and means for providing ingress and egress of a bag expandable substance into and out of said expandable bag including a third tubular member with one end in communication with said expandable bag hydraulic valve means and with the other end adjacent the upper end of said first rigid outer tube adapted to receive said bag expandable substance for transmission through said third tubular member to and from said expandable bag hydraulic valve means, wherein said expandable bag hydraulic valve means functions as a hydraulic valve to open and close the lower end of said second tube responsive to pressure inducing substance transmitted through said third tubular member.

---

**4,129,009**

**ANCHORING CONSTRUCTION ON THE SEA BOTTOM**

**Joost W. Jansz, The Hague, Netherlands, assignor to Hollandsche Beton Groep N.V., Rijswijk, Netherlands**

**Filed Jun. 29, 1977, Ser. No. 811,360**

**Claims priority, application Netherlands, Jun. 29, 1976, 7607130**

**Int. Cl.[2] E02B *17/00***

**U.S. Cl. 405—227** **4 Claims**

**1.** An anchoring assembly, comprising:

(a) A heavy elongated block member of concrete or the like having substantial negative buoyancy,

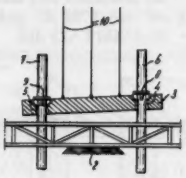
(b) at least two spaced vertical holes respectively extending through the block member proximate the opposite ends thereof,

(c) at least two elongated piles each extending through one

of the holes in the block member and adapted to be vertically driven into the sea bottom,

(d) the diameter of each hole being greater than that of its associated pile whereby the block member may be raised vertically on the driven piles,

(e) at least two abutment means individually secured to each



driven pile at a distance above the block member and having transverse dimensions larger than the diameter of the associated block member hole to thereby limit the vertical raising of the block member on each pile, and

(f) anchor cable means connected to the block member at a position spaced from and between the holes therein and adapted to be coupled to a buoyant load.

---

**4,129,010**

**TUNNEL**

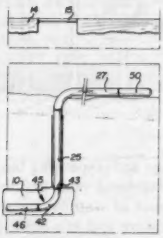
**John A. Owen, Beaconsfield, Canada, assignor to Montreal Engineering Company, Limited, Montreal, Canada**

**Filed Sep. 8, 1977, Ser. No. 831,394**

**Claims priority, application Canada, Aug. 25, 1977, 285449**

**Int. Cl.[2] F16L *1/00***

**U.S. Cl. 405—169** **8 Claims**



1. A method of making a pipeline connection beneath a body of water comprising the steps of positioning a drilling means at the water surface; drilling a hole downwardly through the water bed; introducing a pipe riser sealed at each end into said hole; grouting said inserted pipe riser in said hole to seal said hole from ingress of water; connecting a tunnel section from a shore with said riser; and joining a pipe passed through said tunnel with said pipe riser in such a manner as to permit fluid to flow from one to the other.

---

**4,129,011**

**UNDER ICE PIPELAYING**

**Arthur S. Demers, Mount Royal, and Lloyd A. Hilz, Calgary, both of Canada, assignors to Montreal Engineering Company, Limited, Montreal, Canada**

**Filed Sep. 8, 1977, Ser. No. 831,395**

**Claims priority, application Canada, Aug. 25, 1977, 285448**

**Int. Cl.[2] F16L *1/04***

**U.S. Cl. 405—169** **10 Claims**

1. A method of laying an underwater pipeline under an ice sheet comprising: fabricating a pipe string at a make-up point on shore; forming discrete openings in the ice sheet to provide a plurality of support stations spaced apart along a projected direction of pipe laying; introducing underwater pipe-support cradles through said openings to said support stations; anchoring said cradles to said ice sheet; cutting a trench in the ice from a point of pipe entry into the water which trench follows said direction; towing said pipe string from said make-up point beneath the surface of said ice sheet and through said support cradles; actuating each said support cradle to engage and support said pipe string after the leading end thereof passes

each said support station so that said pipe string is supported from said ice sheet and immediately beneath it; continuing to tow and support the pipe string until the required length of pipe is in place; attaching lowering means to said pipe; releasing said cradles seriatim, and lowering said pipe to the water bottom.

---

**4,129,012**

**HEAT TRANSFER METHOD AND APPARATUS**

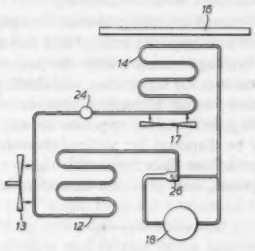
**John H. Mairs, Berwick, Australia, assignor to Newton, John, Chadstone, Australia, a part interest**

**Filed Apr. 18, 1977, Ser. No. 788,132**

**Claims priority, application Australia, Apr. 20, 1976, PC5652**

**Int. Cl.[2] F25B *41/00, 5/00***

**U.S. Cl. 62—113** **13 Claims**



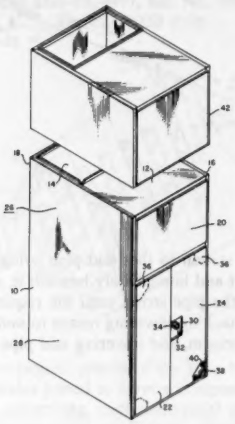
1. In method of transferring heat from a substance in which method heat is extracted from the substance in a heat exchange operation and stored in a compressible fluid which is progressively compressed during intermittently spaced periods and subjected to a further heat exchange operation in which the stored heat is dissipated from the fluid, the improvement wherein fluid already compressed is continuously fed back and mixed with fluid not yet compressed at a controlled rate both substantially throughout and immediately after said periods of progressive compression whereby to reduce the rate of said dissipation of heat during said periods of progressive compression.

**4,129,013**

## AIR-CONDITIONING UNIT WITH MULTI-POSITION COIL

**Louis P. Hine, Jr., Norman, Okla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Sep. 1, 1977, Ser. No. 829,701**
**Int. Cl.[2] F25D *21/14*; F25B *27/00*; F28F *7/00, 13/00***
**U.S. Cl. 62—285** **8 Claims**



1. An air-conditioning unit comprising:

a cabinet including adjacent blower and coil sections, said coil section being of regular hexahedron shape and having access panel means for the front side of said coil section;

a refrigerant evaporator coil of rectangular outline and of fin and tube construction having a pair of opposite ends at the opposite ends of the fins;

coil frame means including means at both of said opposite ends to permit the drainage of condensate therefrom at a location generally in the plane of the face of the coil which always faces downwardly;

a drain pan freely separable from the cabinet and the coil, and having a diagonally open face to receive whichever opposite end of the coil is lower in any of the diagonal dispositions of the coil in the section;

said coil frame means including means to engage said drain pan at both of said opposite ends of said coil and with said condensate drainage means within the pan; and

means in said cabinet for supporting said drain pan in any of the four front-to-rear extending corners with the coil extending diagonally to an opposite corner, so that said cabinet may be disposed for airflow therethrough in upflow and downflow directions with right- and left-hand air entry options, and in either direction horizontal airflow.

---

**4,129,014**

## REFRIGERATION STORAGE AND COOLING TANK

**Talbot A. Chubb, 5023 N. 38th St., Arlington, Va. 22207**

**Filed Jul. 22, 1977, Ser. No. 818,179**
**Int. Cl.[2] F24C *15/16***
**U.S. Cl. 62—333** **14 Claims**

1. A refrigeration cooling and coolant storage system for heat exchanger operation which comprises:

a gas tight housing;

a plurality of containers assembled within said housing;

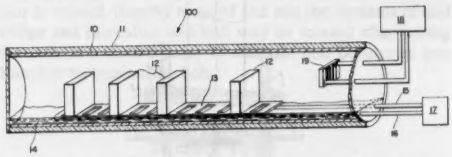
a first fluid which freezes at a temperature below room temperature within said containers;

a volume of "heat pipe" liquid within said housing below said containers;

pipe means immersed within said "heat pipe" liquid within said housing for circulating a second fluid having a freeze point less than that of said "heat pipe" liquid;

a condensation pipe assembly within said housing positioned above said volume of "heat pipe" liquid;

a refrigerator-compressor connected with said condensation pipe assembly for cooling said condensation pipe assembly



by circulation of a volume of refrigerator fluid through said condensation pipe thereby producing freezing of said first fluid within said containers, and a heat exchanger connected with said pipe means immersed in said "heat pipe" liquid to be cooled by fluid circulating through said volume of "heat pipe" liquid.

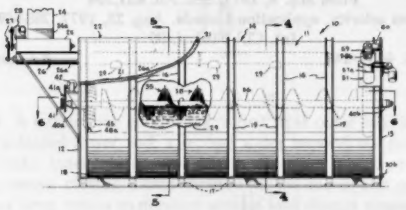
---

**4,129,015**

## ICE STORAGE AND DISPENSING BIN

**William F. Morris, Jr., P.O. Box 1046, Raleigh, N.C. 27602**

**Filed Apr. 22, 1977, Ser. No. 790,015**
**Int. Cl.[2] F25C *5/18***
**U.S. Cl. 62—344** **26 Claims**



10. A cube ice storage and dispensing bin, comprising a large stationary elongated insulated tank defining a closed storage chamber for a large pool of water maintained substantially at water freezing temperature and at a depth such that the water level lies at a suitable level in the tank for storing the ice cubes in floating condition as a large mass of separate ice cubes therein, the tank having opposite feed and discharge transverse ends and longitudinal sides extending therebetween providing an ice storage pool of substantially rectangular plan at the water level, a pair of skeleton screw conveyor flights each having a center shaft journaled in the opposite ends of the tank and a skeleton helical vane member of open network construction extending lengthwise of the tank for moving floating ice cubes in opposite relative directions along first and second longitudinal legs of a circulating loop path inwardly along the sides and ends of the tank, the screw conveyor flights being located at opposite sides of the longitudinal center line of the tank near the sides thereof, transverse ice moving means inwardly adjacent the feed end of the tank for transferring floating ice cubes from an end region of one of said pair of screw conveyor flights to the other, feed means for feeding ice cubes into said tank, discharge conveyor means inwardly adjacent said discharge end for elevating ice cubes from the pool of water at a withdrawal station and conveying them out of the tank to an external discharge station, and means for rotating said screw conveyor flights at a slow speed producing gentle agitation and tumbling of the ice cubes floating in the pool to disrupt tendencies of the ice cubes to form multicube frozen lumps of ice and maintain a fluid slurry of ice cubes and water therein, and said screw conveyor flights and transverse ice moving means being arranged to gently and slowly migrate the

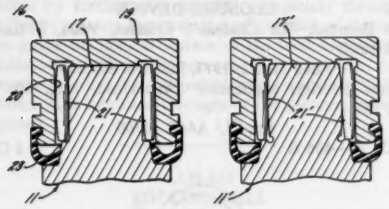
floating ice cubes in a predetermined direction along said circulating loop path to pass through said withdrawal station.

---

**4,129,016**
**UNIVERSAL JOINT CROSS**

**Dean A. Olson, Sr., Rockford, Ill., assignor to Rockford Acromatic Products Co., Rockford, Ill.**

**Filed Aug. 25, 1977, Ser. No. 827,562**
**Int. Cl.[2] F16D** *3/30*
**U.S. Cl. 64—17 A** **3 Claims**



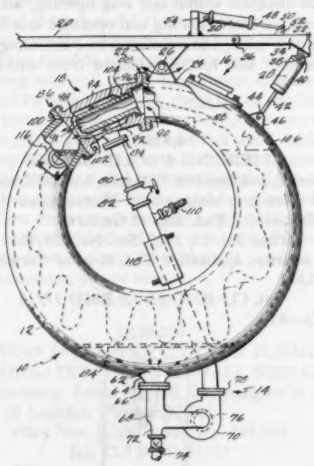
1. A universal joint cross having a central body, four trunnions spaced angularly around and extending outwardly from said body, each of said trunnions being of circular cross-section, a bearing cup telescoped over each trunnion, each of said bearing cups having a cavity of circular cross-section, and an annular row of elongated rollers located within each bearing cup and surrounding each trunnion, each of said rollers being of circular cross-section and each being convexly crowned in a longitudinal direction and symmetrically from its midpoint toward each of its ends.

---

**4,129,017**
**LAB SAMPLE JET DYEING MACHINE**

**James E. Greer, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.**

**Filed Jan. 27, 1977, Ser. No. 763,152**
**Int. Cl.[2] D06B** *3/28*
**U.S. Cl. 68—15** **20 Claims**



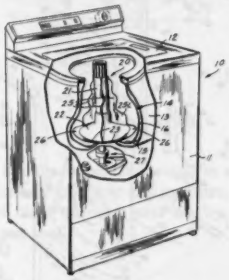
1. A machine for treating textile material in generally rope form with a treating liquid comprising: means defining a closed vessel providing an endless path for circulation of a length of the textile material about a generally horizontal axis through the treating liquid in said vessel; means in said path for forming a generally annular converging jet of liquid surrounding the textile material for at least assisting in circulating the textile material in said path, said jet forming means attached to said vessel; means for withdrawing treating liquid from said vessel means and supplying the liquid under pressure to said jet forming means; and means for mounting said vessel for rotation about said horizontal axis so that the position of said jet forming means is movable along said path.

---

**4,129,018**
**ONE-PIECE AGITATOR WITH CLOTHES LIFTING CAMS**

**Clark I. Platt, St. Joseph, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.**

**Filed Oct. 6, 1977, Ser. No. 839,997**
**Int. Cl.[2] D06F** *17/10*
**U.S. Cl. 68—134** **9 Claims**



1. In an improved agitator for an automatic clothes washing machine, the agitator having a skirt having a circular outer periphery and a center post extending coaxially upwardly therefrom, the improvement of:

a plurality of agitator vanes extending generally radially of the center post and upwardly of the skirt,

and a corresponding plurality of crescent-shaped cams affixed to the periphery of the skirt,

each cam being located between a pair of said vanes,

each of said agitator vanes having a flat vertically extending lower portion which extends radially outwardly at least to a vertical line superjacent the periphery of the skirt and which is flat and coplanar with the axis of the agitator and extends vertically along said line to a level above said cams to form a low pressure area behind the vane when oscillated through a body of laundry liquid,

said cams being disposed to form portions of the surface of a cone coaxial with the agitator and having concavely shaped walls to prevent liquid entering the low pressure area from below,

each said cam having opposite cusped ends each of which terminates closely circumferentially adjacent one of said vanes, and

each said cam having a free edge extending upwardly and outwardly from the periphery of the skirt at approximately a 33° angle from the horizontal to impel clothes engaged by said edge upwardly and outwardly,

whereby the clothes and fabrics being laundered are drawn downwardly upon oscillation of the agitator in a laundry liquid into a low pressure area behind the lower portions of the agitator vanes and above the skirt and inwardly of the cams and are cammed upwardly and outwardly from the agitator in the machine.

---

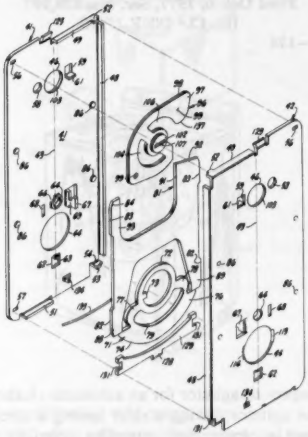
**4,129,019**
**CARTRIDGE FOR A LOCKSET**

**Jan Urdal, Hayward, Calif., assignor to Schlage Lock Company, San Francisco, Calif.**

**Filed May 16, 1977, Ser. No. 796,967**
**Int. Cl.[2] E05B** *59/04, 63/04*
**U.S. Cl. 70—107** **6 Claims**

1. A cartridge for a lockset having a lock mechanism with a

primary rotatable spindle and a secondary rotatable spindle comprising a first cartridge plate, a second cartridge plate substantially identical in size and shape to said first cartridge plate, each plate having flange means on only a portion of its periphery extending to and abutting an unflanged edge portion of the other plate, means securing said cartridge plates directly to each other in registry and spaced apart by said flange means to provide a predetermined space therebetween, means defining openings in said first and said second cartridege plates disposed on a common center line for receiving said primary spindle and said secondary spindle, a rocker lever including



lever arms adapted to be mounted on and rotatable with said primary spindle and located in said space between said cartridge plates with said lever arms on opposite sides of said center line, a slide including a pair of projecting primary lugs at one end and a projecting secondary lug at the other end, said slide being guided in said space by said flange means between said cartridge plates with said primary lugs in position to be engaged by said lever arms, a rotary lever located in said space between and journalled on said cartridge plates in rotary driving engagement with said secondary spindle, and a lever arm included with said rotary lever and in engagement with said secondary lug.

---

**4,129,020**

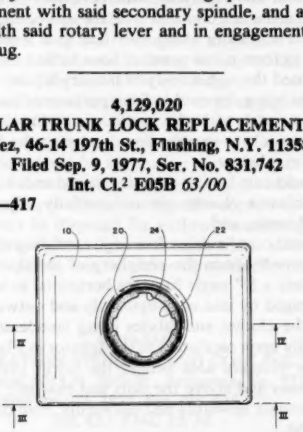
**VEHICULAR TRUNK LOCK REPLACEMENT PLATE**

**Neil Gonzalez, 46-14 197th St., Flushing, N.Y. 11358**

**Filed Sep. 9, 1977, Ser. No. 831,742**

**Int. Cl.[2] E05B *63/00***

**U.S. Cl. 70—417** **3 Claims**



1. A vehicular trunk lock replacement plate for replacing the trunk lock of an automotive vehicle when the original trunk lock is gone and a hole through the body of the vehicle is left in its stead, said vehicular trunk lock replacement plate comprising

an escutcheon plate of generally planar configuration adapted to be affixed to the body of the vehicle for covering the hole through the body of the vehicle, said escutcheon plate having a central circular hole of predetermined diameter formed therethrough and a substantially frustoconical protrusion around said central hole, said frustoconical protrusion having a base end spaced from said plate with a slotted circular hole formed therethrough coaxially with said central hole and of smaller diameter than the predetermined diameter, said base end having a plurality of keyway slots formed therein around said slotted hole for accommodating a trunk lock replacement.

---

**4,129,021**

**CLOSURE DEVICE**

**Attilio Brentini, "Le Chateâu", Crissier, Vaud, Switzerland (CH-1023)**

**Filed Jun. 2, 1977, Ser. No. 802,805**

**Claims priority, application Switzerland, Aug. 30, 1976, 10948/76**

**Int. Cl.[2] A44B *15/00***

**U.S. Cl. 70—456 R** **6 Claims**

1. A closure device including, a ring having an opening, a two-part body provided with a seat and including an arcuate passage therewithin, said passage containing a portion of said ring to permit rotary displacement of said ring about its own axis of rotation, a generally V-shaped retainer part of resilient material disposed within said body, one limb of said retainer part disposed within said seat, the other limb of said retainer part including a laterally projecting locking element biased toward said ring and locking said ring against arcuate displacement when disposed within said ring opening, and said other limb including a free actuating end operable exteriorly of said body whereby, manipulation of said free actuating end causes displacement of said locking element from within said ring opening.

---

**4,129,022**

**PIERCING A SOLID BILLET**

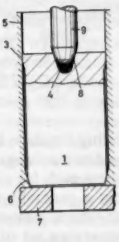
**Horst Thönnes, and Joachim Wünsche, both of Remscheid, Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany**

**Filed Jul. 27, 1977, Ser. No. 819,494**

**Claims priority, application Fed. Rep. of Germany, Aug. 3, 1976, 2635342**

**Int. Cl.[2] B21C *23/32;* B21D *37/18***

**U.S. Cl. 72—41** **7 Claims**



1. Method of completely piercing a solid, unpierced, cylindrical, metal billet, comprising the steps of:

forming an initial well into one axial front end of the billet, the well having a curved bottom merging with a conical surface;

filling the well at least partially with lubricant;

placing the billet into a cylindrical receiver; and

inserting a piercing mandrel into said well, said mandrel having a configuration of a truncated cone with a flat or slightly convex front end having a lesser curvature than the curved bottom of the well which partially but not completely fills the well upon being inserted into the well and engages the well's conical surface, and piercing the billet by forcing said mandrel completely through the billet by causing the conical configuration of the mandrel to move the conical surface of the well deeper into the billet without direct engagement of the bottom of the well by the mandrel front, thereby leaving a portion of the well filled with lubricant throughout the piercing until completed.

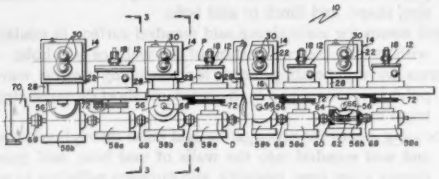
---

**4,129,023**

## ROLLING MILL

**Donald Sieurin, Shrewsbury, Mass., assignor to Morgan Construction Company, Worcester, Mass.**

**Filed Oct. 11, 1977, Ser. No. 841,166**
**Int. Cl.[2] B21B** *35/02, 1/18*
**U.S. Cl. 72—235** **5 Claims**



1. In a rolling mill having a plurality of roll stands aligned along the mill pass line, each roll stand having parallel roll shafts carrying cooperating pairs of work rolls, with the roll shafts of at least some of said roll stands being offset angularly with respect to the roll shafts of the other of said roll stands in order to eliminate the necessity for twisting the product as it progresses from stand to stand along the mill pass line, apparatus for driving said roll shafts comprising: intermeshed gear means carried by each pair of roll shafts for establishing a drive connection therebetween; a driven wheel connected to one roll shaft of each pair; a gear unit for each roll stand, each gear unit having an input shaft and an output shaft, the output shaft of each gear unit being parallel to the roll shafts of the roll stand associated therewith and having a driving wheel thereon; flexible endless means for connecting said driving and driven wheels, the input shafts of said gear units being interconnected along a single drive line parallel to the mill pass line and being driven by a common power source.

---

**4,129,024**

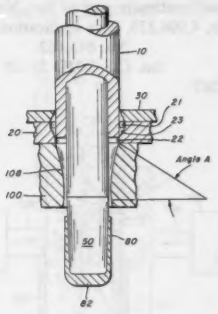
## METHOD AND APPARATUS FOR FORMING ELONGATED, TAPERED WALL SHELLS

**Charles H. Deveney, Lower Burrell, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.**

**Filed Nov. 9, 1977, Ser. No. 849,996**
**Int. Cl.[2] B21D** *51/54*
**U.S. Cl. 72—329** **12 Claims**

1. A method of forming an elongated, unitary shell having a thin side wall and relatively thick end integral therewith, the shell formed from a substantially circular blank cut from sheet material, the method comprising the steps of:

(a) providing a blank in a blank holder on a die having an effective entrance aperture and an effective exit aperture, the entrance aperture having an extent substantially commensurate in size with the size of the blank to be drawn, said die having a cavity, the walls of which converge inwardly from said entrance aperture to said effective exit aperture, said wall defined by an arc of a sector of a circle, said arc passing from the entrance aperture to the exit aperture, said sector having an angle in the range of 12° to



34°, said circle having its center located in substantially the same plane as said effective exit aperture; and

(b) displacing said blank through said die by action of a punch to form said shell.

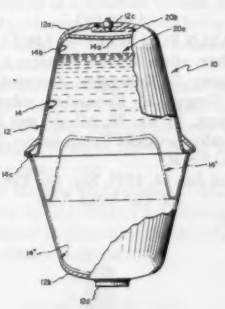
---

**4,129,025**

## METHOD OF FABRICATING AN EXPULSION TANK DIAPHRAGM

**Lee F. Carey, and Anthony J. Friona, both of North Tonawanda, N.Y., assignors to Textron Inc., Providence, R.I.**

**Filed Feb. 25, 1977, Ser. No. 772,331**
**Int. Cl.[2] B21D** *22/24*
**U.S. Cl. 72—348** **4 Claims**

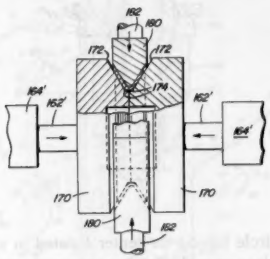


1. A method of improving the resistance of a generally cup-shaped article to buckling deformation incident to rolling upon itself into an inverted configuration, said article being formed from a material of the type having its stress characteristics altered by cold rolling deformation, including the steps of fabricating an article preform having a configuration essentially corresponding to said inverted configuration of said article, annealing said preform as required to substantially reduce the presence therein of residual stresses produced by fabrication of said preform and pre-rolling said pre-form upon itself onto a mandrel to define said article and impart directional residual stresses and strains to said article tending to improve the resistance of said article to buckling deformation incident to rolling thereof upon itself into said inverted configuration.

## 4,129,026
## METHOD OF MAKING A PULLEY GROOVE

William C. Pierce; Samuel M. Berry, both of Dallas, and Arthur D. Johnson, Carrollton, all of Tex., assignors to Pitts Industries, Inc., Dallas, Tex.

Division of Ser. No. 732,431, Oct. 14, 1976, Pat. No. 4,067,572, which is a continuation-in-part of Ser. No. 630,886, Nov. 11, 1975, Pat. No. 4,004,335. This application Oct. 19, 1977, Ser. No. 843,662
Int. Cl.² B21D *53/26*
U.S. Cl. 72—367 1 Claim



1. The method of manufacturing a pulley groove comprising the steps of:

(a) cutting a short section of tubing from a long piece of tubing;

(b) forming the short section of tubing into a peripherally running, smoothly curved, radially inwardly extending concave shape by axially movable dies;

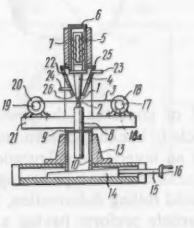
(c) press forming the tubing by both axial and radial forming operations into a peripherally running shape having a central, inner apical wall defining an inner periphery for mounting on a hub and a pair of radially diverging, substantially flat walls defining a radially outwardly opening pulley groove.

---

## 4,129,027
## APPARATUS FOR MAKING METAL STRIP

Evgeny P. Ignashev, ulitsa Korzhenevskogo, 13, kv. 85, Minsk, U.S.S.R.; Evmeny G. Konovalov, deceased, late of Minsk, U.S.S.R.; by Georgy E. Konovalov, administrator, ulitsa Akademicheskaya, 13, kv. 20, Minsk, and by Nina E. Zaitseva, administrator, prospekt Kosmonavtov, 92, kv. 92, Leningrad, both of U.S.S.R.

Filed Jul. 14, 1977, Ser. No. 815,782
Int. Cl.² B21J *7/20*
U.S. Cl. 72—429 3 Claims

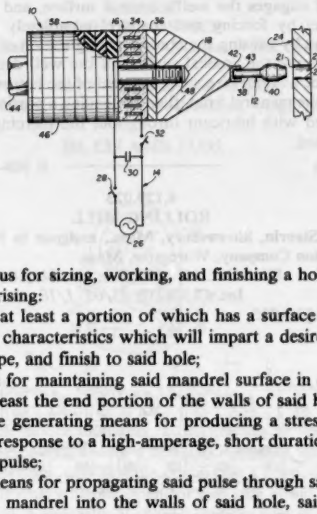


1. An apparatus for making metal tape from wire comprising: working tools - a hammer and an anvil; a metal rod which is vertically adjustable relative to said hammer, said anvil being mounted on an end face of the rod; a source of ultrasonic oscillations having a concentrator in contact with said hammer; the length of said rod being multiple to one quarter of ultrasonic wavelength; feeding and receiving spools for said wire and strip, respectively; a mechanism for tensioning said wire arranged between said spools.

## 4,129,028
## METHOD AND APPARATUS FOR WORKING A HOLE

Basil P. Leftheris; Joseph H. Mainhardt, and Walter Schwenk, all of Huntington, N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Dec. 19, 1977, Ser. No. 862,204
Int. Cl.² B21J *7/30*
U.S. Cl. 72—430 11 Claims



1. Apparatus for sizing, working, and finishing a hole in an article comprising:

a mandrel at least a portion of which has a surface having physical characteristics which will impart a desired final size, shape, and finish to said hole;

tool means for maintaining said mandrel surface in contact with at least the end portion of the walls of said hole;

stress wave generating means for producing a stress wave pulse in response to a high-amperage, short duration electrical impulse;

focusing means for propagating said pulse through said tool and said mandrel into the walls of said hole, said pulse having a rise time, intensity, and duration sufficient to set the material in said hole walls into a condition of plastic flow whereby said physical characteristics of said mandrel surfaces are imparted to said hole; and

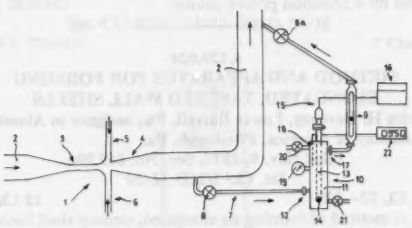
an energy source for supplying said electrical impulse to said stress wave generating means.

---

## 4,129,029
## DEVICE FOR MEASURING THE AMOUNT OF GAS DISSOLVED IN A LIQUID

Manfred Moll, Vandoeuvre; Christian D'Hardmemare, and Nicolas Midoux, both of Nancy, all of France, assignors to Tepral, France

Filed Feb. 7, 1977, Ser. No. 766,195
Claims priority, application France, Dec. 22, 1976, 76 39349
Int. Cl.² G01N *27/46, 33/14*
U.S. Cl. 73—19 8 Claims



1. In combination with beer fermentation apparatus having a main pipe for transporting a water-entrained mixture of wort, yeast and gas to a fermentation tank: a measuring device for measuring the amount of gas dissolved in the water comprising; means defining an elongated measuring chamber having upper and lower ends and having means defining an inlet for

charging the water-entrained mixture into said measuring chamber and an outlet for discharging the water-entrained mixture from said measuring chamber, said outlet being located in the vicinity of said chamber upper end and said inlet being located a sufficient distance above said chamber lower end and coacting with said outlet to effect formation of a relatively stagnant flow region substantially free of gas bubbles in said measuring chamber beneath the level of said inlet during flow of the water-entrained mixture through said measuring chamber; conduit means connecting said measuring chamber inlet to an upstream portion of said main pipe and connecting said measuring chamber outlet to a downstream portion of said main pipe to divert flow of a part of the water-entrained mixture from said main pipe through said measuring chamber and then back to said main pipe such that the gas bubbles and lighter mixture particles entrained in the water flow in said inlet upwardly through said measuring chamber and out said outlet while the heavier mixture particles entrained in the water tend to flow downwardly and settle in the stagnant flow region; gas measuring means extending downwardly into said measuring chamber towards said lower end and including a gas-sensitive element disposed in the stagnant flow region of said measuring chamber which is substantially free of gas bubbles for measuring the amount of gas dissolved in the water-entrained mixture and providing a corresponding output signal indicative of the dissolved gas content.

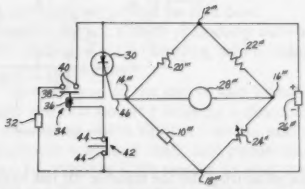
---

**4,129,030**

## SENSING APPARATUS AND METHOD

**James P. Dolan, Seattle, Wash., assignor to ADS Systems, Inc., Seattle, Wash.**

**Filed Oct. 13, 1977, Ser. No. 841,802**
**Int. Cl.[2] G01N *27/04***
**U.S. Cl. 73—23** **13 Claims**



1. Sensing apparatus for liquids, vapors and gases comprising:

(a) detection device means of the type comprising a plurality of independently anchored electrically conductive particles, adsorbently sensitive to liquids, vapors or gases, with the particles arranged in sequential contact to form one or more conductive paths between separated points;

(b) voltage supply means, electrically connected to the detection device means and supplying electrical potential across the detection device means sufficient to cause said detection device means to operate in a current saturated condition; and

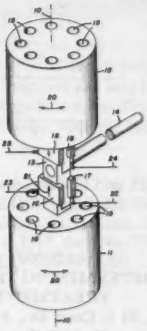
(c) indicating means electrically connected to the detection device means to indicate when the current saturated detection device means are exposed to the substance being sensed.

**4,129,031**

## IMMERSIBLE LIQUID DENSITOMETER

**Stephen W. Tehon, Clay, and Edward M. Pruski, Liverpool, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.**

**Filed Sep. 16, 1977, Ser. No. 833,733**
**Int. Cl.[2] G01N *9/00***
**U.S. Cl. 73—32 A** **12 Claims**



1. An immersible liquid densitometer comprising:

A. a vibrator which vibrates in torsion about a predetermined axis comprising:

(1) a pair of symmetrical masses having equal rotational moments of inertia and exteriors substantially conforming to a surface of revolution about said axis to permit tangential surface motion and to preclude substantial surface motion normal to the surrounding liquid during torsional vibration to minimize energy coupling to the surrounding liquid, said masses containing self-filling perforations which admit liquid upon immersion, and which are designed to cause said admitted liquid to rotate with the masses to form effective rotational moments of inertia as a function of both the mass and the admitted liquid, said perforations being symmetrical to cause said effective rotational moments of inertia to remain equal,

(2) a resilient member supporting said masses symmetrically at the respective ends thereof in said torsional vibration mode, said resilient member being itself supported midway between the ends, at the node of said torsional vibration, and

(3) means for exciting said torsional vibration, and

B. means coupled to said vibrator for measuring the resonant frequency thereof to determine the density of the liquid in which said vibrator is immersed.

---

**4,129,032**

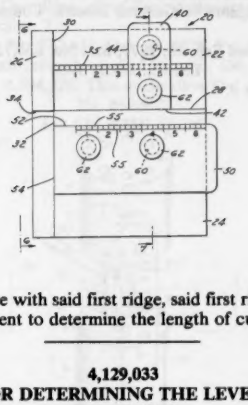
## RIBBON DECORATION AND METHOD OF MAKING THE SAME

**Albert E. Salmi, 9380 Burt Rd., Detroit, Mich. 48228**

**Division of Ser. No. 724,266, Sep. 17, 1976, abandoned. This application Aug. 8, 1977, Ser. No. 822,906**
**Int. Cl.[2] B31B *1/14***
**U.S. Cl. 93—33 R** **7 Claims**

1. A device for forming predetermined transverse slits in a length of ribbon, comprising means providing a slitting surface, first, second and third straight elongated ridges on said surface, said second and third ridges intersecting and abutting and extending transversely of and in opposite directions away from said first ridge and being spaced from one another along the length of said first ridge, said second and third ridges

providing locators for cutters used to transversely slit a length of ribbon on said surface positioned with its longitudinal center



line coextensive with said first ridge, said first ridge serving as a cutter abutment to determine the length of cut of the slits.

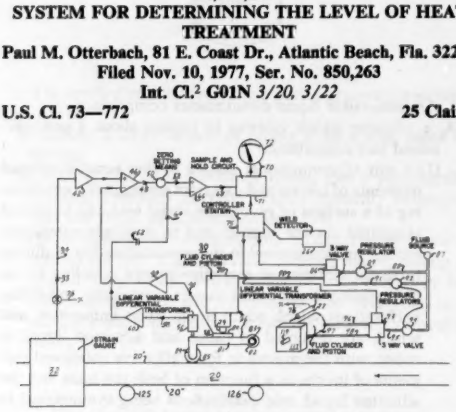
---

**4,129,033**

## SYSTEM FOR DETERMINING THE LEVEL OF HEAT TREATMENT

**Paul M. Otterbach, 81 E. Coast Dr., Atlantic Beach, Fla. 32233**

**Filed Nov. 10, 1977, Ser. No. 850,263**
**Int. Cl.[2] G01N *3/20, 3/22***
**U.S. Cl. 73—772** **25 Claims**



1. In a system for determining the level of heat treatment of a metal strip under tension in a continuous process line comprising a first strain gauge for producing a first voltage proportional to the tension applied longitudinally of said strip, selective means for forceably deflecting said strip in a direction laterally of said strip without materially effecting the tension being applied longitudinally to said strip, a second strain gauge for producing a second voltage proportional to the force applied to said strip by said selective means, means for producing a third voltage proportional to the amount of deflection of said strip produced by said selective means, means for differentiating between a said third voltage produced by a gradual difference in strip size and a said third voltage resulting from a sudden deflection of said strip by said selective means for providing a differentiated signal, means for combining said first and second voltages and said differentiated signal to produce a combined signal indicative of the level of heat treatment of said strip.

---

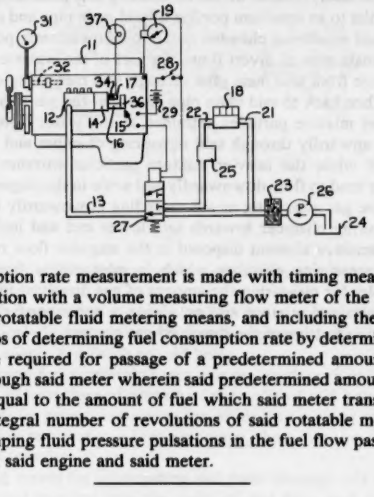
**4,129,034**

## METHOD AND APPARATUS FOR CHECKING ENGINE PERFORMANCE

**Albert B. Niles, Chillicothe; Larry H. Franzen, Peoria; William J. Gardner, Pekin, and Russel W. Grob, Metamora, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.**

**Filed Apr. 19, 1971, Ser. No. 135,300**
**Int. Cl.[2] G01M *15/00***
**U.S. Cl. 73—117.3** **2 Claims**

1. In a method of determining the power output of an internal combustion engine which is of a type having a known Specific Fuel Consumption rating at a predetermined speed, the steps comprising measuring the rate of fuel consumption at said engine while operating said engine substantially at said predetermined speed, maintaining said speed of said engine and the load thereon substantially constant while measuring said fuel consumption rate thereof to assure validity of said power output determination, and multiplying said measured fuel consumption rate by said known Specific Fuel Consumption rating to determine power output of said engine, wherein said fuel



consumption rate measurement is made with timing means in conjunction with a volume measuring flow meter of the form having rotatable fluid metering means, and including the further steps of determining fuel consumption rate by determining the time required for passage of a predetermined amount of fuel through said meter wherein said predetermined amount of fuel is equal to the amount of fuel which said meter transmits in an integral number of revolutions of said rotatable means, and damping fluid pressure pulsations in the fuel flow passage between said engine and said meter.

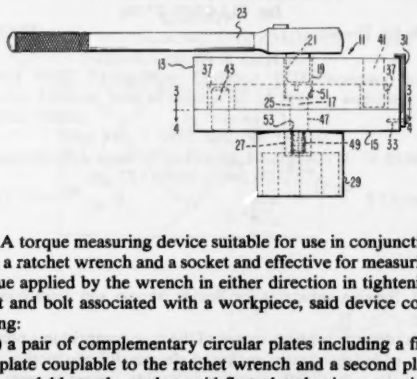
---

**4,129,035**

## BI-DIRECTIONAL, MULTIPLE RANGE TORQUE MEASURING DEVICE

**Alvino J. Ango, 1252 Elliott St., Madison Heights, Mich. 48071**

**Filed Sep. 23, 1977, Ser. No. 836,157**
**Int. Cl.[2] G01L *3/14***
**U.S. Cl. 73—136 B** **7 Claims**



1. A torque measuring device suitable for use in conjunction with a ratchet wrench and a socket and effective for measuring torque applied by the wrench in either direction in tightening a nut and bolt associated with a workpiece, said device comprising:

(a) a pair of complementary circular plates including a first plate couplable to the ratchet wrench and a second plate couplable to the socket, said first plate having a continuous channel groove formed in the lower surface thereof in contiguous relationship to its periphery,

(b) means for detachably coupling said pair of plates for independent rotation,

(c) indicator means associated with said pair of plates and effective for readably measuring the degree of their said independent rotation, and

(d) means for compressibly and variably driving said second plate and said socket upon the application of a rotational force upon said ratchet wrench and said first plate in either direction, whereby the torque applied by said rota-

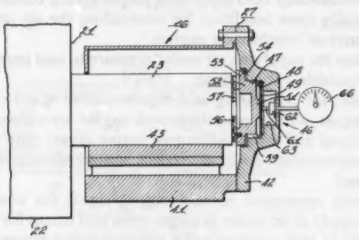
tional force is designated by said indicator means in response to the rotation of said second plate relative to said first plate, said driving means including a selected pair of arcuately disposed, loose-ended, equally tensioned compression springs operably disposed within said channel groove of said first plate and a pair of dowel pins projectably disposed within said channel groove and separating the loose ends of said pair of compression springs, a first of said dowel pins depending from and being fixed to said first plate and a second of said pins being fixed to and extending upwardly from said second plate, the arrangement being such that upon rotation of the ratchet wrench and first plate in either direction, said first dowel pin depending from said first plate serves to drive said second dowel pin and said second plate by means of the downstream one of said pair of compression springs, said second plate and said socket being driven at a relatively slower rate according to the torque that is applied to said ratchet wrench and the corresponding degree of compression that is applied to said downstream compression spring.

---

## 4,129,036
## ALIGNMENT INDICATOR FOR ROLLER-TYPE SUPPORT

**Robert M. Bliemeister, Milwaukee, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.**

**Filed Jun. 17, 1977, Ser. No. 807,558**
**Int. Cl.² G01L *5/12***
**U.S. Cl. 73—140** **2 Claims**



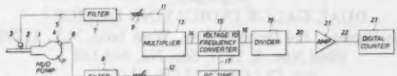
1. An alignment indicating roller support assembly for a rotary kiln comprising:
- a base;
- a housing movably supported on said base;
- a roller support having a shaft projecting outwardly therefrom and journaled in said housing, said housing enclosing the free end of said shaft;
- a closure plate secured to the end of said housing, said closure plate and said housing defining a chamber;
- a force transmitting piston disposed within said chamber in axial alignment with said shaft, said piston being in force receiving relationship with respect to said shaft to move therewith in a direction parallel to the axis of said shaft for transmitting the force executed thereto by said shaft;
- a thrust washer between the axial end of said shaft and the adjacent end of said piston; and,
- a mechanical force sensing means within said chamber in position to sense the thrust force exerted on said force transmitting piston by said shaft;
- indicating means carried externally of the chamber by said closure plate and operably connected to said mechanical sensing means to indicate the relative amount of the force sensed by said mechanical sensing means; and,
- a deflection plate within said chamber and interposed between the opposite end of said piston and said mechanical force sensing means, said deflection plate being operative to deflect when loaded by the end thrust from the roller support shaft as transmitted by said piston to thereby operate said mechanical force sensing means which operates said indicating means to indicate the amount of the force for a visual indication of the degree of misalignment between the axis about which said roller support rotates and the axis about which said kiln rotates;
- adjusting means for moving said housing structure on said base to effect a positioning movement of said roller support for positioning the axis about which said roller support rotates in a plane which is substantially parallel to the axis about which said kiln rotates to thereby counteract the axial thrust force exerted by said shaft and reestablish the rolling supporting relationship between the kiln and said supporting roller;
- whereby said indicating means will indicate an amount of force which is indicative of the desired supporting relationship between said support and said kiln and the adjustment of the roller support can be effected to reestablish the parallel relationship between the two axes of rotation.

---

## 4,129,037
## APPARATUS FOR WEAR DETECTION

**David C. Toalson, 21119 Park Wick, Katy, Tex. 77450**

**Filed Mar. 21, 1977, Ser. No. 779,769**
**Int. Cl.² G01M *15/00***
**U.S. Cl. 73—151** **16 Claims**




1. Apparatus for measurement of expected wear of mechanisms that are subjected to a plurality of wear inducing factors, said apparatus comprising:
- detecting means for detecting each of said plurality of wear inducing factors during operation of said mechanisms and for converting the condition of said wear inducing factors into a plurality of electrical analog signals;
- divider means receiving at least one of said analog signals and selectively dividing said analog signals by preset numbers;
- an electrical counter capable of presenting a cumulative display;
- electrical signal processing means for multiplying said plurality of selectively divided electrical analog signals to obtain a product signal and modifying said product signal for operation of said electrical counter, said electrical counter providing a cumulative display responsive to cumulation of said product signals.

---

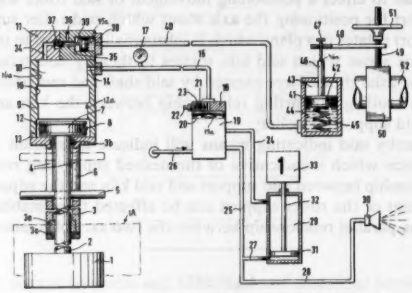
## 4,129,038
## APPARATUS FOR INDICATING THE LEVEL OF LIQUIDS IN THE CONTAINERS OR WATERCRAFT

**Bernhard Leutenegger, Münchenstein, Switzerland, assignor to Logotronic AG., Basel, Switzerland**

**Filed Mar. 21, 1977, Ser. No. 779,504**
**Claims priority, application Fed. Rep. of Germany, Mar. 23, 1976, 2612217**
**Int. Cl.² F16K *31/18*; G01F *23/08***
**U.S. Cl. 73—307** **32 Claims**

1. Apparatus for indicating the level of liquid which is selectively admitted into at least one container, comprising a float disposed in said container and arranged to rise with the rising level of liquid in the container; an enclosure having a space containing gas, said enclosure including a reciprocable piston connected with said float, located outside of said container and bounding a portion of said space, the volume of said space decreasing, with attendant compression of the gas therein, as a result of movement of said piston in response to upward movement of said float; pneumatic response means pneumatically coupled with the space for sensing gas compression in the space and responding to a predetermined compresson of gas in

the space and signal generating means operatively connected to said pneumatic response means for generating at least one



visible and/or audible signal when the response means senses the predetermined compression of gas in said space.

---

**4,129,039**

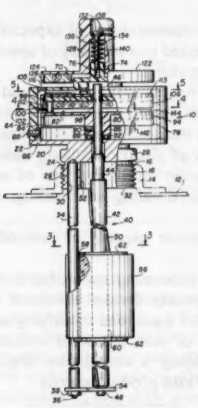
## DUAL GAUGE INDICATING DEVICE

**Gaetano Pignato, 214 Douglas Ave., West Islip, N.Y. 11795**

**Filed Nov. 3, 1977, Ser. No. 848,102**

**Int. Cl.[2] G01F** *23/08, 23/12*

**U.S. Cl. 73—310** **14 Claims**



1. In a device for indicating the level of liquid in a container,

a first dial rotatable in a first direction to indicate an increase in liquid level and in a second direction to indicate a decrease therein so as to provide a continuous indication of the liquid level in the container by means of the relative rotative position of said first dial,

a second dial releasably engaged with said first dial for rotation therewith in said first direction and non-rotatable therewith in said second direction, said second dial registering by its relative rotative position the magnitude of an increase in the container liquid level irrespective of a subsequent decrease in such level,

and means cooperating with one of said dials for disengaging said first and second dials and for rotating said second dial in said second direction to reset the same to an initial registering position whereby only those increases in liquid level occurring subsequent to resetting of the second dial to said initial position will be registered thereby, said disengaging and rotating means including magnetic means for releasable coupling with said second dial to release the same from engagement with said first dial so as to enable the resetting of said second dial to its initial position by rotation of the same in said second direction.

---

**4,129,040**

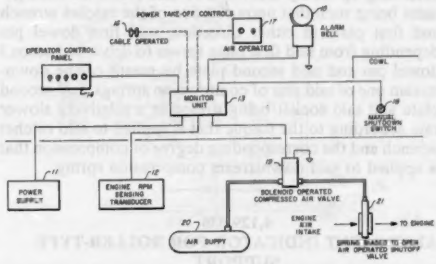
## ENGINE OVERSPEED CONTROL SYSTEM

**Joseph C. Hayden, Jr., 7902 Captain Dr., Houston, Tex. 77036**

**Filed Sep. 29, 1977, Ser. No. 837,906**

**Int. Cl.[2] G01M** *15/00*

**U.S. Cl. 73—507** **13 Claims**




1. A system for monitoring and controlling the speed of an internal combustion engine, comprising:

means for sensing the speed of rotation of the crankshaft of an internal combustion engine and for providing an electrical signal representative thereof;

pneumatically operable valve means spring biased to a normally open condition for controlling the air intake of an internal combustion engine;

means for supplying air under pressure to said pneumatically operable valve means;

means for comparing said representative speed of rotation signal with a predetermined engine overspeed setpoint signal and for providing an output signal only when said representative signal exceeds said predetermined signal; and

means responsive to said output signal for controlling a supply of air under pressure from said means for supplying air to said pneumatically operable valve means, whereby when said output signal is present said pneumatically operable valve means is allowed to receive air under pressure thereby closing off the air intake of an internal combustion engine.

---

**4,129,041**

## METHOD AND APPARATUS FOR RECEIVING ULTRASONIC WAVES BY OPTICAL MEANS

**Wolf Bickel, Bergisch-Gladbach, Fed. Rep. of Germany, assignor to Krautkramer-Branson, Incorporated, Stratford, Conn.**

**Filed Oct. 21, 1977, Ser. No. 844,459**

**Claims priority, application Fed. Rep. of Germany, Nov. 3, 1977, 2710638**

**Int. Cl.[2] G01H** *9/00*

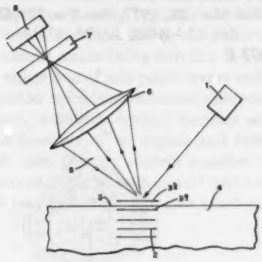
**U.S. Cl. 73—657** **16 Claims**

1. The method for receiving an ultrasonic wave from a workpiece surface portion by optical means free of physical contact with such workpiece portion comprising:

transmitting a beam of light from a frequency stabilized single mode laser upon the workpiece surface portion which undergoes deformation responsive to the presence of an ultrasonic wave, thereby causing frequency modulation of the incident light;

collecting the diffused frequency modulated light reflected at said surface portion and transmitting said light through a light filter having at least one steep light absorption line, whereby the frequency of said laser and that of the light filter is selected to cause the nominal frequency of said laser to be disposed along the steep part of the slope of the

light absorption line of the filter to thereby provide amplitude modulated light passed through the filter, and



transmitting the amplitude modulated light to photoelectric sensing means adapted to provide an electrical output signal which is responsive to the amplitude modulated light passed through the filter.

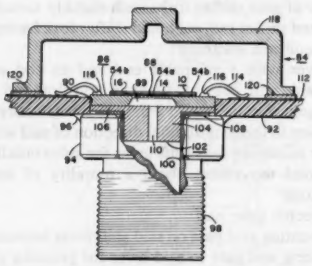
---

**4,129,042**

## SEMICONDUCTOR TRANSDUCER PACKAGED ASSEMBLY

**Warren C. Rosvold, Sunnyvale, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.**

**Filed Nov. 18, 1977, Ser. No. 852,909**
**Int. Cl.[2] G01L *9/06***
**U.S. Cl. 73—727** **11 Claims**



1. A semiconductor transducer assembly, comprising:
(a) a rigid mounting member;
(b) a transducer member including a relatively thick peripheral frame portion and a relatively thin membrane portion attached to and circumscribed by said frame portion, said membrane portion being slotted to form a folded cantilever spring susceptible to vibratory motion relative to said frame portion, at least said membrane portion being formed of semiconductor material and provided with regions forming piezoresistor elements which change their electrical resistance when subjected to varying degree of mechanical stress;
(c) a rigid interface member of semiconductor material separating said transducer member from said mounting member and having a first side facing said transducer member and an opposing second side facing said mounting member;
(d) means securing said mounting member to surface portions at least of the second side of said interface member;
(e) means securing the frame portion only of said transducer member to the first side of said interface member at a limited number of spaced locations distributed so as to produce an unobstructed finite gap between said membrane portion and said interface member for permitting restrained bending motion of said membrane during application of mechanical force thereto and for effecting squeeze film damping of vibratory motion of said membrane after removal of said mechanical force.

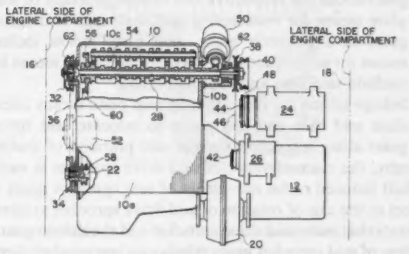
---

**4,129,043**

## ACCESSORY DRIVE

**Yoshikazu Ishikawa, Chofu, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan**

**Filed Feb. 15, 1977, Ser. No. 768,877**
**Claims priority, application Japan, Feb. 17, 1976, 51/17948[U]**
**Int. Cl.[2] F16H *7/00, 37/00;* F02F *7/00***
**U.S. Cl. 74—219** **5 Claims**




1. In a motor vehicle having an engine compartment;
an engine in said compartment having a crankshaft extending transversely across the longitudinal axis of the vehicle, said engine having a first end and a second end which are spaced along an axis about which said crankshaft is rotatable;
a transmission mounted within said engine compartment at said second end of said engine;
an accessory disposed in said engine compartment above said transmission and adjacent said second end of said engine;
an accessory drive shaft mounted on said engine, at the upper portion thereof, and having one end projecting beyond said first end of said engine and an opposite end projecting beyond said second end of said engine;
a rotary drive connection between said one end of said accessory drive shaft and said crank shaft; and
a rotary drive connection between said opposite end of said accessory drive shaft and said accessory.

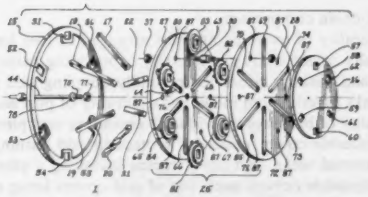
---

**4,129,044**

## VARIABLE GEAR RATIO CHAIN DRIVE SYSTEM FOR BICYCLES

**Marlo W. V. Erickson, 12024 Kling St. # 104, North Hollywood, Calif. 91607, and Stanley W. Volk, 3441 Calle Vistosa, Tucson, Ariz. 85715**

**Filed May 19, 1977, Ser. No. 798,410**
**Int. Cl.[2] F16H *55/12, 55/30, 55/52, 55/54***
**U.S. Cl. 74—244** **17 Claims**



1. A finite range infinitely variable gear ratio chain sprocket for transmitting a driving force to a driven sprocket via a chain, said drive sprocket comprising in combination:
a. spaced apart base and end plates mounted on a common

axis of rotation for translating the driving force to said drive sprocket;

b. a plurality of shafts, selected ones of which are twisted about their longitudinal axis for interconnecting said base plate with said end plate, each of said plurality of shafts having one end connected to said base plate closer to the axis of rotation than the other end connected to said end plate, whereby said plurality of shafts en toto resemble a frusto conical section;

c. a plurality of sprocket gears for meshing with the chain, each of said sprocket gears being mounted upon one of said plurality of shafts;

d. twist means for limiting rotation of each of said sprocket gears about the respective one of said plurality of shafts;

e. plate means for maintaining said shaft mounted sprocket gears in a common plane, said plate means including means for accommodating travel of said plate means intermediate said base and end plates; and

f. linkage means for repositioning said plate means intermediate said base and end plates to relocate said sprocket gears along respective ones of said plurality of shafts;

whereby, the circumference of said drive sprocket is variable by shaft induced radial movement of said sprocket gears with respect to the axis of rotation of said drive sprocket to alter the gear ratio between said drive sprocket and the driven gear and rotation of said sprocket gears relative to one another through said twist means and maintains said sprocket gears in mesh with the links of the engaged chain.

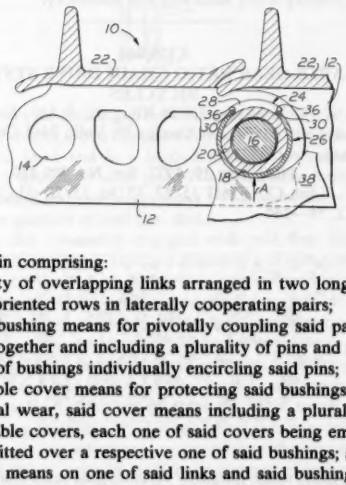
---

**4,129,045**

## CHAIN WITH BUSHING PROTECTIVE COVER

**Keisuke Kishitani, Tokyo, Japan, assignor to Caterpillar Mitsubishi Ltd., Tokyo, Japan**

**Filed Sep. 15, 1977, Ser. No. 833,429**
**Int. Cl.² F16G *13/04, 13/06, 15/02***
**U.S. Cl. 74—255 R** **14 Claims**




1. A chain comprising:

a plurality of overlapping links arranged in two longitudinally oriented rows in laterally cooperating pairs;

pin and bushing means for pivotally coupling said pairs of links together and including a plurality of pins and a plurality of bushings individually encircling said pins;

replaceable cover means for protecting said bushings from external wear, said cover means including a plurality of releasable covers, each one of said covers being embracingly fitted over a respective one of said bushings; and

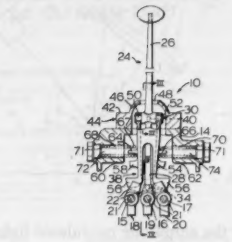
retaining means on one of said links and said bushings for respectively anchoring each one of said covers in place on said respective bushing and preventing relative rotation therebetween.

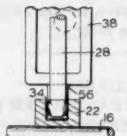
**4,129,046**

## GEAR SHIFT CONTROL

**Howard R. Lemcke, Jr., Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.**

**Filed Mar. 21, 1977, Ser. No. 779,456**
**Int. Cl.² B60K *20/04, 20/12***
**U.S. Cl. 74—473 P** **4 Claims**




1. A gear shift control for use in transmissions and the like comprising:

a plurality of shifter rails;

a plurality of gear shifter forks each slidably mounted on an associated shifter rail, each said shifter fork having a single slot of uniform width;

a shift lever with a grippable end and an end selectively engageable with each of said slots, said slots and said lever end engageable therewith being of substantially identical dimension in the longitudinal direction of said shifter rails;

means for mounting said shift lever for substantially universal pivotal movement about a plurality of intersecting pivot axes;

a gear selector gate; and

means mounting said gate on said shift lever including means connecting said gate to said lever for pivoting movement on a pivot axis intersecting the pivot axes of said shift lever.

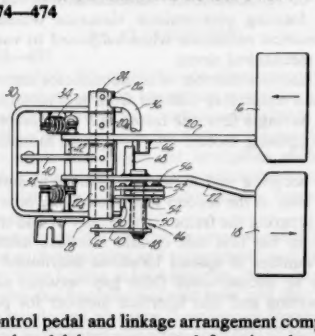
---

**4,129,047**

## CONTROL ARRANGEMENT

**Arthur E. Dornan, Ypsilanti, Mich., assignor to Massey-Ferguson Inc., Detroit, Mich.**

**Filed Jun. 29, 1977, Ser. No. 811,229**
**Int. Cl.² B60K *20/00;* G05G *5/10***
**U.S. Cl. 74—474** **10 Claims**



1. A control pedal and linkage arrangement comprising; first and second pedal levers mounted for pivotal movement, a

transmission control means supported for pivotal movement in one direction upon movement of one pedal lever and in another direction upon movement of the other pedal lever, said transmission control means being adapted for connection to a transmission for movement in opposite directions from a neutral position into a forward and reverse driving range, said transmission control means being movable in a first range upon movement of either one of said pedal levers and remaining in a stationary position upon simultaneous movement of both of said pedal levers, a throttle control member adapted for connection to the controls of an engine and being movable to increase speed, said throttle control member being movable upon movement of either or both of said first and second pedal levers beyond said first range and into a second range.

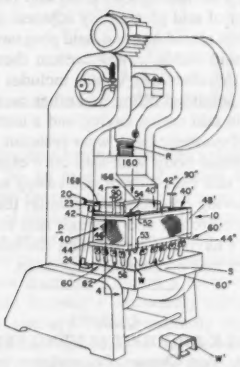
---

**4,129,048**

## POWER PRESS GUARD

**James L. Shocklee, St. Charles, and Edward H. Tayloe, Ferguson, both of Mo., assignors to ACF Industries, Inc., New York, N.Y.**

**Filed Jul. 26, 1977, Ser. No. 819,271**
**Int. Cl.[2] F16P** *1/02, 3/10*
**U.S. Cl. 74—612** **19 Claims**



1. A power press or tool guard comprising:

a generally vertical protective portion made of a material which is at least partly transparent through which the operator may view the operation of the tool or press;

a second protective portion depending from said first protective portion and extending inwardly toward the press or tool;

said second protective portion including a plurality of arms or tynes which are pivotably mounted on the lower portion of the first protective portion;

first hinge means mounting said first and second protective portions on one side of said tool or guard;

second hinge means pivotably mounting said first and second protective portions about the front of said press or tool;

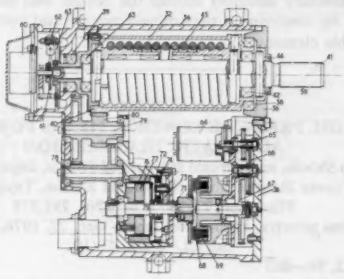
said first and second protective portions being pivotable by means of said first and second hinge means between a first position allowing access to the press or tool and a second position covering the exposed operating parts of the press or tool; control means mounted on said first protective portion for varying the inclination of the arms or tynes on a given side of the guard; and fastening means for adjusting the length of individual tynes on a given side of the guard.

**4,129,049**

## POWER JACK INCORPORATING STRESS-RESPONSIVE COMPONENTS

**Jean-Claude V. Perard, Velizy, France, assignor to Societe Francaise d'Equipements pour la Navigation Aerienne (S.F.E.N.A.), Velizy-Villacoublay, France**

**Filed Feb. 3, 1977, Ser. No. 765,286**
**Int. Cl.[2] B64C** *13/04*
**U.S. Cl. 74—625** **8 Claims**



1. A rotatable jack, including a stress means, for a control system for an aerodyne, comprising:

(a) a stress means having a rotatable anchorage and including a tubular sleeve rotatably mounted relative to a stationary structure; an outwardly projecting shaft coaxially extending within said sleeve and rotatably mounted relative to said sleeve; a helical coil spring located in the space intermediate said projecting shaft and said tubular sleeve, said spring being coupled at each end to a plate which is rotatable relative to said projecting shaft; two radial shoulders fixedly coupled to said sleeve, and two pins fixedly coupled to the outwardly projecting shaft, with said shoulders and said pins being arranged so that each of said plates can come into contact and drive or be driven by a corresponding shoulder or pin; and

(b) means for rotatably driving said sleeve including a motor having its shaft coupled to the guiding element of a disengaging means, said guiding element being connected to said tubular sleeve by a transmission including a brake means.

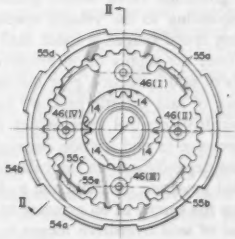
---

**4,129,050**

## GEAR MEANS OF AN AUTOMATIC TRANSMISSION FOR AUTOMOBILES

**Teruo Akashi, Okazaki; Kazuaki Watanabe, and Yukio Terakura, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan**

**Filed Aug. 10, 1977, Ser. No. 823,461**
**Claims priority, application Japan, Apr. 28, 1977, 52-49445**
**Int. Cl.[2] F16H** *3/44, 1/28*
**U.S. Cl. 74—750 R** **6 Claims**



1. A gear means of an automatic transmission for automo-

biles, comprising a housing, a planetary gear means including a sun gear, a ring gear, planetary pinions and a carrier, and friction engaging means having two relatively rotatable elements and adapted to selectively connect said carrier to another element which is either said sun gear or said housing, said carrier and one of said two relatively rotatable elements being integrally connected with each other to form a carrier assembly which in turn provides a planetary assembly by incorporating said planetary pinions therein, wherein the mass balance of said planetary assembly around the central axis thereof is adjusted by removing a part of said one of said two relatively rotatable elements.

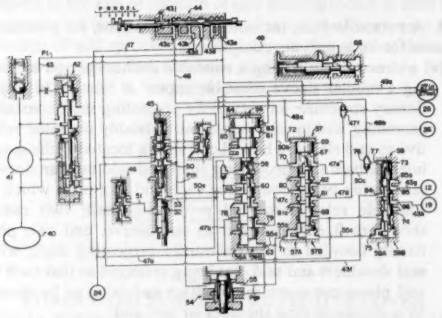
---

**4,129,051**

## OIL PRESSURE CONTROL MEANS FOR AN AUTOMATIC TRANSMISSION

**Yoshio Shindo, and Hiroshi Ito, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan**

**Filed Apr. 27, 1977, Ser. No. 791,575**
**Claims priority, application Japan, Dec. 27, 1976, 51/159179**
**Int. Cl.² B60K *41/10***
**U.S. Cl. 74—867** **6 Claims**



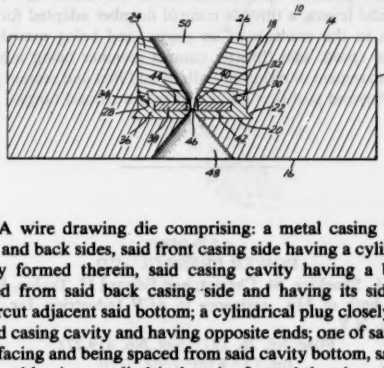
1. An oil pressure control means for an automatic transmission which comprises a fluid torque converter, an overdrive means of a planetary gear type, said overdrive means comprising a planetary gear mechanism, a plurality of friction engaging means and a one-way clutch and adapted to allow the output shaft thereof to run over the input shaft thereof due to the disengagement of said one-way clutch in the reverse rotational direction thereof when one of said friction engaging means arranged in parallel to said one-way clutch is disengaged, and a reduction gear means including a reduction gear mechanism and a plurality of friction engaging means and adapted to effect various gear stages, said oil pressure control means comprising a source of oil pressure, a line pressure regulating valve which generates a line pressure from the oil pressure of said source, a throttle pressure regulating valve which generates a throttle pressure corresponding to the throttle opening, a governor valve which generates a governor pressure corresponding to the vehicle speed, a manual shift valve for shifting speed ranges, a speed shift valve or valves which change over the supply of oil pressure to said friction engaging means of said reduction gear mechanism depending upon the balance of said throttle pressure and said governor pressure, an overdrive control valve which changes over the supply of oil pressure to said friction engaging means of said overdrive means depending upon the balance of said throttle pressure and said governor pressure, and a change-over valve which intercepts the supply of oil pressure to said one friction engaging means of said overdrive means in response to the supply of oil pressure to one of said friction engaging means of said reduction gear means which accomplishes a low speed stage.

**4,129,052**

## WIRE DRAWING DIE AND METHOD OF MAKING THE SAME

**Paul Bieberich, Fort Wayne, Ind., assignor to Fort Wayne Wire Die, Inc., Fort Wayne, Ind.**

**Filed Oct. 13, 1977, Ser. No. 841,885**
**Int. Cl.² B21K *5/20***
**U.S. Cl. 76—107 A** **12 Claims**



8. A wire drawing die comprising: a metal casing having front and back sides, said front casing side having a cylindrical cavity formed therein, said casing cavity having a bottom spaced from said back casing side and having its side wall undercut adjacent said bottom; a cylindrical plug closely fitted in said casing cavity and having opposite ends; one of said plug ends facing and being spaced from said cavity bottom, said one plug end having a cylindrical cavity formed therein, said plug cavity having a bottom spaced from said other plug end, the inside diameter of said plug cavity adjacent said bottom being greater than that at said one end, said plug cavity bottom being spaced from said casing cavity bottom thereby defining another cavity therebetween which includes said undercut; a body of metal solidified filling said other cavity thereby securing said plug in said casing cavity; and a metal blank having a core formed of synthetic hard, wear-resistant material encapsulated in said metal body with said core concentric with said casing cavity; said back side of said casing and said other end of said plug having countersunk openings therein respectively extending therethrough and through said metal body to said core, said core having a die opening therethrough communicating between said countersunk openings.

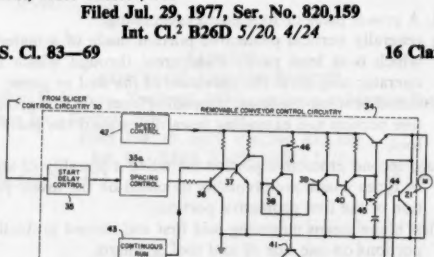
---

**4,129,053**

## BULK PRODUCT SLICING SYSTEM

**David P. Kent, West Chester, Pa., assignor to Control Process, Inc., West Chester, Pa.**

**Filed Jul. 29, 1977, Ser. No. 820,159**
**Int. Cl.² B26D *5/20, 4/24***
**U.S. Cl. 83—69** **16 Claims**




1. In a bulk product slicing equipment, which includes means for intermittently advancing the bulk product into a rotating slicing blade and conveyor means for intermittently removing accumulations of sliced product from the vicinity of the blade, the conveyor means including a conveyor drive motor which is controllably actuatable between a low and a high speed, the improvement which comprises:

means for controlling the acceleration of the motor from the low to the high speed and the deceleration from the high

to the low speed so that the accumulations are not deformed during this removal from the blade vicinity,

said controlling means being adjustable separately from any other controls for the conveyor drive motor.

---

## 4,129,054
## PUNCHING PRESS

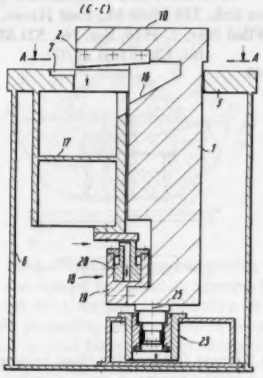
**Harald Fazis, Lörrach, Germany, assignor to Ludwig Boschert, Maschinen- und Apparatebau GmbH & Co. KG, Germany**

**Filed Jan. 6, 1977, Ser. No. 757,200**

**Claims priority, application Fed. Rep. of Germany, Jan. 20, 1976, 2601858**

**Int. Cl.² B21D *28/02, 37/12***

**U.S. Cl. 83—165** **8 Claims**



1. A notching machine having a vertically reciprocating ram which is guided by an axial guiding system disposed on a machine frame with the ram carrying at its upper end by means of a projecting tool holder an upper blade assembly cooperating with a lower blade assembly in which there is cutting clearance between the blade assemblies comprising

said upper blade assembly forming a forwardly extending apex, said ram forming a rearwardly extending apex at least adjacent said upper blade assembly and at least over an axial length corresponding to the the vertical stroke of said ram, said rearwardly extending apex extending away from said forwardly extending apex for providing substantially maximum notching depth between said apexes,

said axial guiding system including first and second pin and guide bushing assemblies disposed between an upper end of said ram and said machine frame, a third pin and guide bushing assembly secured to a bottom end of said ram.

---

## 4,129,055
## ELECTRONIC ORGAN WITH CHORD AND TAB SWITCH SETTING PROGRAMMING AND PLAYBACK

**Billy J. Whittington, Jasper; Timothy L. Burns, French Lick, and Alan B. Welsh, Jasper, all of Ind., assignors to Kimball International, Inc., Jasper, Ind.**

**Filed May 18, 1977, Ser. No. 797,931**

**Int. Cl.² G10H *1/00***

**U.S. Cl. 84—1.01** **14 Claims**

1. In an electronic organ having tone generator means connected to transducer means via keyers, playing keys, and playing key controlled means for developing a respective data signal for each playing key which is actuated, a note sequencer comprising:

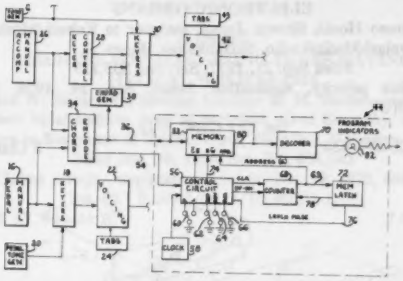
a memory having a plurality of storage locations,

mode switch means for placing said note sequencer alternatively in a playback mode and a program mode,

record means operable when said note sequencer is in the program mode for sequentially writing a plurality of said data signals into said memory for storage therein,

playback means operable when said sequencer is in the playback mode for reading the stored signals from said memory,

control means including a player actuated advance switch for causing said playback means to advance from one



signal to the next for reading the respective data signals stored therein in the same order in which the signals were written each time said advance switch is actuated with only one of said signals being read each time said advance switch is actuated, and

means for actuating said keyers in conformity with the data signals read from said memory.

---

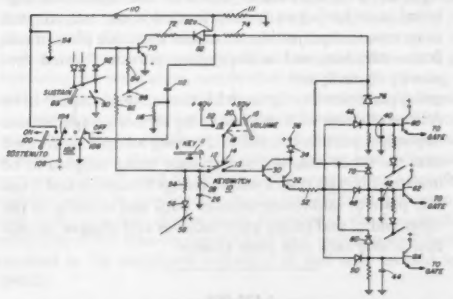
## 4,129,056
## PEDAL CONTROL CIRCUITS FOR ELECTRONIC PIANO

**Richard W. Jensen, 583 Fay Ave., Elmhurst, Ill. 60126, and Richard H. Peterson, 11748 Walnut Ridge Dr., Palos Park, Ill. 60464**

**Filed Dec. 21, 1976, Ser. No. 753,144**

**Int. Cl.² G10H *1/02***

**U.S. Cl. 84—1.26** **4 Claims**



1. In an electronic musical instrument including a plurality of playing keys each adapted to be moved between a normal position and an operated position and wherein the instantaneous intensity of a musical tone generated in response to movement of a playing key to its operated position is determined by the magnitude of a voltage appearing across a capacitor, a damper circuit including an electronic switch in series with an impedance connected to form a discharge path across said capacitor, a sustaining pedal operative when moved from a normal position to an operated position to disable said damper circuit, and means associated with said playing key for rendering said damper circuit operative upon return of said playing key from its operated to its normal position, the improvement comprising:

a sostenuto pedal adapted to be moved between a normal position and an operated position, and

circuit means controlled by said sostenuto pedal for render-

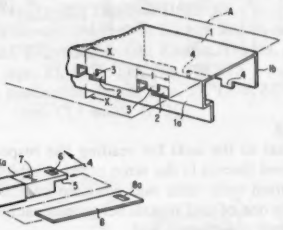
ing said damper circuit inoperative with respect to musical tones corresponding to those playing keys, and only such keys, as are in the operated position at the moment said sostenuto pedal is moved to its operated position.

---

**4,129,057**
**KEYBOARD SUPPORT MECHANISM FOR ELECTRONIC ORGANS**

**Yoshitomo Hoshi, Showa, Japan, assignor to Kabushikigaisha Kawaigakkiseisakusho, Shizuokaken, Japan**

**Filed Sep. 21, 1977, Ser. No. 835,135**
**Claims priority, application Japan, Sep. 29, 1976, 51-129853[U]**
**Int. Cl.[2] G10C *3/12***
**U.S. Cl. 84—434** **5 Claims**



**1.** A supporting mechanism for the keyboards of an electronic organ, comprising;

a frame member adapted to be attached to the bottom side of a keyboard chassis, said frame member having a front side plate and a back side plate;

said front side plate of said frame member having at least one opening formed therein and a projecting tab;

said back side plate having at least one stopper projection being aligned from front to rear with a corresponding projecting tab of said front side plate;

a keyboard lever for each keyboard of said organ, said keyboard lever having an opening formed in one end, adapted to receive said projecting tab of said front side plate of said frame member, and a depending portion formed forwardly thereof; and

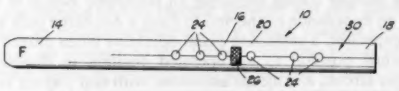
a spring plate member for each keyboard lever adapted to be retained therein with one end being supported against said depending portion thereof, and having an opening formed near the other end, said spring plate being adapted to be inserted through one of said openings formed in said front side plate of said frame member until said opening in the other end of said spring plate receives said stopper projection in said back side plate thereof.

---

**4,129,058**
**MUSICAL INSTRUMENT TEACHING AID**

**Leah M. Ross, Rte. 1, Box 73, Sedgwick, Kans. 67135**

**Filed Sep. 19, 1977, Ser. No. 834,674**
**Int. Cl.[2] G10B *15/08***
**U.S. Cl. 84—485 R** **5 Claims**



**1.** A musical instrument teaching aid for teaching the fingerings of a recorder, the teaching aid comprising:

a dowel having the approximate dimensions of a recorder, one end of said dowel being beveled to depict the mouthpiece of said recorder, thereby defining top and bottom portions of said dowel;

a plurality of depressions in said top and bottom portions, said depressions being disposed along the length of said dowel in substantially the same locations as the corresponding holes in said recorder, said depressions being of such number and locations to indicate which of said recorder's holes must be covered by the player's fingers to play only one particular note playable by said recorder; and

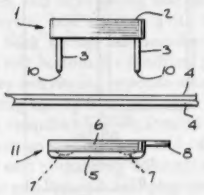
indicia marked on said dowel to indicate said one particular note.

---

**4,129,059**
**STAPLE-TYPE FASTENER**

**William F. Van Eck, 228 Main St., East Haven, Conn. 06512**

**Filed Nov. 7, 1974, Ser. No. 521,851**
**Int. Cl.[2] F16B *15/00***
**U.S. Cl. 85—49** **26 Claims**



**1.** In a two element fastener for sheet materials of the type that includes a staple having a cross-member and a pair of parallel, bendable prongs spaced apart at a predetermined distance and fixedly attached to and extending perpendicularly from the cross-member and a receiving member for the free ends of the prongs, the improvement wherein the receiving member comprises: an oblong thin member of predetermined thickness having oppositely disposed substantially flat continuous sides extending parallel to one another and spaced apart by the predetermined thickness, the length of the member being greater than the distance of the spacing of the prongs by an amount equal to a fraction of the spacing of the prongs, the member being formed of material soft enough to be punctured completely through the thickness thereof by the staple without bending the prongs, the side of the member opposite the staple being adapted to receive the free ends of the prongs after the bending of the prongs, the member being strong enough to permit disassembly of the receiving member from the staple subsequent to bending over the prongs after penetration through the receiving member by manually exerting a separating force between the cross-member of the staple and the receiving member sufficient to at least partially straighten and withdraw the prongs from the receiving member without tearing the material thereof.

**6.** In a two element fastener for sheet materials of the type that includes a staple having an elongated cross-member and a pair of parallel bendable prongs spaced apart from one another at a predetermined interval along the length of the cross-member and fixedly attached to and extending perpendicularly from the cross-member and a receiving member for the free ends of the prongs, the improvement wherein the receiving member comprises:

an elongated thin plate having end portions located at the extremities of the length thereof and oppositely disposed face portions, each of the end portions of the plate being disposed beyond and yet substantially adjacent the different ends of a line extending along the length of the plate and having its ends spaced apart at a distance substantially corresponding to the predetermined interval between the parallel prongs, the plate being formed of material being sufficiently soft to enable the face of the plate directed

toward the prongs to be penetrated before bending the prongs to engage the prongs to the plate, the material of the plate being strong enough to permit disassembly of the receiving member from the prongs by manually exerting a separating force between the crossmember of the staple and the receiving member sufficient to withdraw and at least partially straighten the prongs from the receiving member without tearing the material thereof.

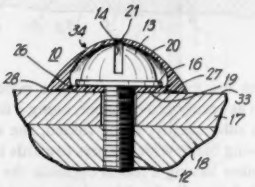
---

**4,129,060**

## SCREW HEAD COVER

**William Gould, Millburn, N.J., assignor to Nyltite Corporation, South Plainfield, N.J.**

**Filed Nov. 10, 1977, Ser. No. 850,143**
**Int. Cl.[2] A47G *3/00*; F16B *15/02***
**U.S. Cl. 85—53** **9 Claims**




1. A fastener head covering device comprising a body member having top and bottom faces and an opening for the reception of the shank of a fastener, a plurality of peripherally spaced upwardly projecting wing members integrally formed with and hinged to said body member along the peripheral border thereof, said wing members having side-by-side bases and closing means responsive to axial pressure on said body member to swinging said wing members inwardly toward a position forming a substantially closed cap overlying said top face.

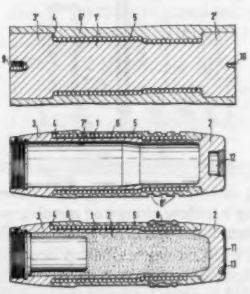
---

**4,129,061**

## FRAGMENTATION CASING FOR SHELLS, WARHEADS AND THE LIKE AND METHOD OF MAKING SAME

**Hans Bedall, Nüremberg, and Max Rentzsch, Rothenbach, both of Fed. Rep. of Germany, assignors to DIEHL, Nuremberg, Fed. Rep. of Germany**

**Filed Mar. 23, 1977, Ser. No. 780,480**
**Claims priority, application Fed. Rep. of Germany, Mar. 23, 1976, 2612149; Jul. 31, 1976, 2634570**
**Int. Cl.[2] F42B *13/18, 13/48***
**U.S. Cl. 86—20 B** **5 Claims**



1. A method of making a fragmentation casing for projectiles, especially shells and warheads, which includes the steps of: providing a solid raw body having a base body with ends as well as a front section and a rear section each having end faces and an intermediate section including an outside therebetween, machining to rated dimensions only the outside of said intermediate section, applying to said machined intermediate section a layer of fragmentations and hardenable sinter material, sintering and pressing said fragmentations and sinter material into said machined intermediate section, and after hardening of said sinter material, machining over the outside thereof to the rated dimensions, providing an axial bore in the thus machined body, and placing an explosive charge in said bore.

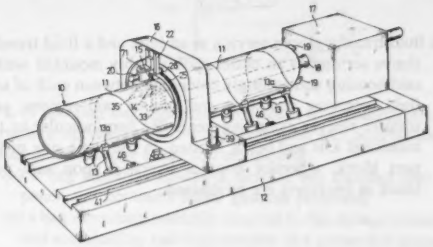
---

**4,129,062**

## MACHINE FOR MACHINING TUBES HAVING HELICAL WELD SEAMS

**Klaus W. Bergmann, Spenge; Günther B. H. Steffen, and Herbert Mönkemöller, both of Bielefeld, all of Germany, assignors to Bergmann & Steffen OhG, Salzuflen, Germany**

**Filed Jan. 30, 1976, Ser. No. 654,043**
**Claims priority, application Austria, Jan. 30, 1975, 694/75**
**Int. Cl.[2] B23C *1/00, 1/16*; B23D *1/00***
**U.S. Cl. 90—11 R** **7 Claims**



1. A machine for machining tubes having a helical weld seam and for simultaneously reducing internal and external weld beads by machining, comprising a machine bed, at least one tube bearing means mounted on the machine bed for supporting a tube having a wall with a helical weld seam in the wall, first and second power driven tools mounted such that said first tool is located within the tube and said second tool located outside the tube, said tools thereby opposing each other on the sides of the wall of the tube, and means for displacing said first and second tools in dependence upon the helical weld seam in the longitudinal extension of the tube and following the weld seam, and further comprising a housing on said bed and gearing in said housing, a chuck on said housing connected to said gearing, said tube is mounted in said chuck, said chuck being axially rotatable and having support rams abutting against the outer tube surface, upper end rollers supporting said tube, said displacing means comprising a first feed spindle which is displaceable in the longitudinal extension of said tube on a slide displaceably mounted in the longitudinal extension of the tube on the machine bed, said first tool fixedly retained in the peripheral extension of said tube on said feed spindle.

---

**4,129,063**

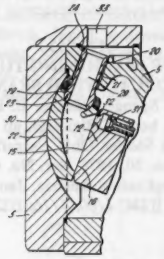
## BENT AXIS PUMPS AND MOTORS

**Richard J. Ifield, Beecroft, Australia, assignor to Ifield Engineering Pty. Limited, Dural, Australia**

**Filed Sep. 17, 1976, Ser. No. 724,100**
**Claims priority, application Australia, Oct. 1, 1975, PC3394**
**Int. Cl.[2] F01B *13/04***
**U.S. Cl. 91—506** **7 Claims**

1. A bent axis pump or motor, comprising:
a stationary housing means defining a fluid inlet and a fluid outlet region, said housing including an arcuate surface therein,
a port block arcuately movable along said surface within said housing to vary the pump or motor displacement and having a plurality of fluid receiving chambers,
a cylinder block housing a plurality of operating cylinders

and rotating about a central axis and rotating relative to said port block to present one of said operating cylinders in a fluid intake position to one of said plurality of fluid receiving chambers and to subsequently present said one of said operating cylinders in a fluid discharge position to another of said plurality of fluid receiving chambers, and



a fluid transfer sleeve serving as an inlet and a fluid transfer sleeve serving as an outlet each slidably mounted within said housing and sealingly extending between each of said fluid receiving chambers and one of said regions, said transfer sleeves extending generally perpindicular to the rotational axis and being located on the same side of the port block, whereby couples imposed upon said port block in operation are minimized.

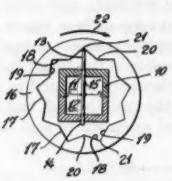
---

**4,129,064**

## FLUID OPERATED STEPPING MOTOR

**Atef E. F. Fahim, 10124 Place Meilleur, No. 30, and Richard M. H. Cheng, 3452 Rosedale Ave., N.D.G., both of Montreal, Quebec, Canada**

**Filed Apr. 8, 1976, Ser. No. 675,228**
**Int. Cl.² F16H *27/02***
**U.S. Cl. 92—129** **3 Claims**



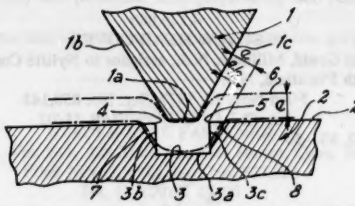
1. A fluid operated stepping motor comprising a double acting cylinder having a working member, a pair of piston rods fixed to said working member, said working member being displaced by pressure from a pressure source applied to said cylinder, a cam in surrounding relationship with respect to said cylinder and in planar alignment with said piston rods and having a plurality of teeth asymetrically disposed on an inner face thereof, each tooth having a power profile surface and an idle profile surface, said piston rods being axially aligned and extending out of opposite cylinder heads to alternately engage said power profile on teeth of said cam disposed in alignment therewith such as to result in relative rotation of the cam with respect to the cylinder as each piston rod end alternately engages teeth oppositely disposed with respect to each other.

**4,129,065**

## APPARATUS FOR GROOVING SHEET MATERIAL

**Louis G. Corse, Chaumont-sur-Tharonne, France, assignor to Machines Chambon, Orleans, France**

**Filed Dec. 29, 1976, Ser. No. 755,164**
**Claims priority, application France, Jan. 8, 1976, 76 00301**
**Int. Cl.² B26D *3/08*; B31F *1/00***
**U.S. Cl. 93—58 ST** **6 Claims**



1. Apparatus for grooving a flat thin material of fibrous structure, such as cardboard or paper, along a line about which the material is subsequently to be folded, the apparatus comprising a grooving blade which tapers towards an end face, and a backing member having a recess opposite the end face of the blade, the blade being displacable relative to the backing member so as to move the end face of the blade towards the base of the recess in the backing member, wherein the two edges delimiting the recess in the backing member are provided with a plurality of notches which define bevelled surfaces which match the tapering surfaces of the blade, which are generally parallel to said tapering surfaces and which are spaced from these surfaces by a distance substantially equal to the thickness of the material to be grooved.

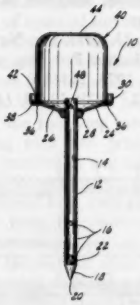
---

**4,129,066**

## BASTING DEVICE

**John C. Corley, 10469 Whitebridge, St. Louis, Mo. 63141**

**Filed Feb. 3, 1978, Ser. No. 874,853**
**Int. Cl.² A47J *37/10***
**U.S. Cl. 99—345** **6 Claims**



1. A basting device for injecting fluid material under pressure comprising a hollow elongated member with perforations adjacent a forward end and with an annular flange adjacent a rearward end, a tip having a pointed head for penetrating a food article threadedly attached to the forward end of the hollow elongated member adjacent the perforations, a detachable, rigid bowl threadedly attached to the flange, said flange forming a cover for the bowl and including a plurality of peripherally spaced grooves communicating with the bowl for pressure relief and said elongated member extending through the flange into the bowl and including perforations for straining the basting fluid.

## 4,129,067
## BACON COOKING APPARATUS

Peter M. Relland, 27 Eighth Ave., Milford, Conn. 06460

Continuation of Ser. No. 727,228, Sep. 27, 1977, abandoned. This application Dec. 9, 1977, Ser. No. 859,005
Int. Cl.[2] A47J *37/08*
U.S. Cl. 99—391 9 Claims

1. Apparatus adapted to removably support a strip of bacon to be cooked in a toaster having spaced heating elements comprising:

means adapted to support said strip in said toaster between said heating elements to be cooked thereby, said support means comprising an inner support means adapted to receive said strip of bacon and to drain the grease away from the bacon, and an outer support means adapted to receive said inner support means;

drain means carried by said support means for receiving the grease drained from the cooking bacon; and

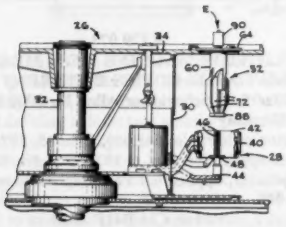
handle means facilitating the insertion of said apparatus into the toaster and the removal of said apparatus from the toaster.

---

## 4,129,068
## CITRUS SLICING APPARATUS

Elton L. McKenzie, Auburndale, Fla., assignor to FMC Corporation, San Jose, Calif.

Filed May 19, 1977, Ser. No. 798,290
Int. Cl.[2] A23N *4/12*
U.S. Cl. 99—538 6 Claims



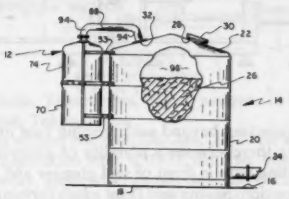
1. Apparatus for slicing a citrus fruit comprising means for supporting a peeled citrus fruit in a fixed position with its axial core in a predetermined spacial orientation, a slicing head comprising a head portion and a plurality of blades uniformly circumferentially spaced about the axis of said head with said axis being coincident with said core of said fruit, means for rigidly and immovably mounting each of said blades to said head portion, each of said blades being flat in a plane which extends parallel to but spaced from said axis of the head, means for moving said head in a straight line path along the axis thereof so that said blades pass through said fruit with none of the planes of the blades passing through said core or directly adjacent thereto whereby a plurality of uniform sections may be cut from said fruit with all of the cuts passing through the radially extending membranes of the fruit at a relatively wide angle.

---

## 4,129,069
## BREATHER BAG APPARATUS

Andy L. Thompson, Rte. 2, Courtland, Kans. 66939

Filed Aug. 17, 1977, Ser. No. 825,279
Int. Cl.[2] A23P *1/00*
U.S. Cl. 99—646 S 4 Claims



1. A breather bag apparatus connected to a material storage structure operable to allow for expansion and contraction of gases in the storage structure, comprising:

(a) a bag assembly having a flexible bag member that expands and contracts under gaseous pressures;

(b) a bag mounting assembly secured to the storage structure and surrounding said bag member in a protective manner;

(c) a conduit connector assembly connected at one end to said bag member and at another end to the storage structure to provide free flow of gases therebetween;

(d) said bag mounting assembly including a support connector member and a protector shell member connected to said support connector member;

(e) said support connector member connected to said bag member and said conduit connector assembly for flow of gases therebetween;

(f) said protector shell member encloses said bag member on all sides thereof without a bottom wall; and wherein said bag member acts similar to a diaphragm member to equalize pressures between the atmosphere and interior of the storage structure and prevent air from entering the silo structure and said bag member is protected on all sides and top thereof but said bag member is readily observed from below to monitor condition thereof.

---

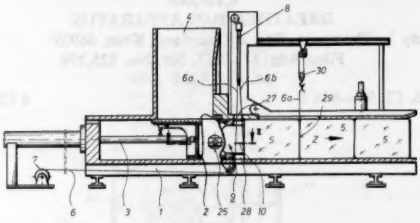
## 4,129,070
## BALING PRESSES FOR THE PRODUCTION OF BOUND BALES

Dietmar Kaffka, Willich, Fed. Rep. of Germany, assignor to Lindemann Maschinenfabrik GmbH, Dusseldorf, Fed. Rep. of Germany

Filed Oct. 19, 1977, Ser. No. 843,543
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1977, 2728203
Int. Cl.[2] B65B *13/18*
U.S. Cl. 100—17 5 Claims

1. In a baling press for the production of bound bales of predominantly non-metallic waste material, said press comprising a pressing box, a pressing plunger, said plunger including a front wall defining a pressing face of said plunger, means movably mounting said pressing plunger in said pressing box and means for moving said plunger to and fro in said pressing box in a pressing stroke and a retraction stroke, the improvement comprising a binding comb and means mounting said binding comb on said plunger for movement relative to said plunger between a forward position and a retracted position, said binding comb comprising a plurality of plates having front

edges, means mounting said plates parallel to and spaced apart from one another, and means for moving said plates between a forward position corresponding to said forward position of said comb and a retracted position corresponding to said retracted position of said comb, said plates, when in said forward



position, projecting beyond said pressing face of said plunger and defining therebetween a plurality of grooves for the passage of binding wire in front of said plunger and, when in said retracted position, having said front edges forming parts of said pressing face of said plunger.

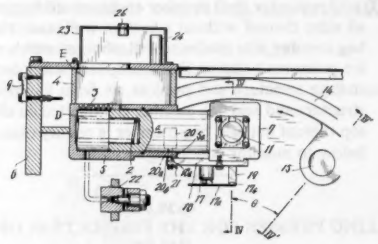
---

**4,129,071**

## ANTI-OVERRUN DEVICE FOR THE SLIDE IN A PRESS

**Yoshihiro Oishi, Sagamihara, Japan, assignor to Aida Engineering, Ltd., Kanagawa, Japan**

**Filed Jan. 10, 1977, Ser. No. 757,889**
**Claims priority, application Japan, Mar. 8, 1976, 51/90215**
**Int. Cl.[2] B30B *1/26, 15/14***
**U.S. Cl. 100—53** **2 Claims**



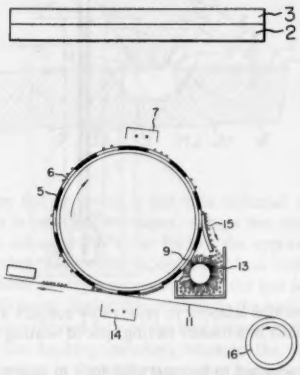
1. An anti-overrun device for a slide in a press comprising: a crankshaft; a rotary member secured to the crankshaft; a projection extending from the side of the rotary member; a cylinder adapted to be secured to a framework of a press; a piston slidably received within the cylinder; a pin supported by the piston for movement into and out of a circle described by the rotation of the projection extending from the rotary member; control means connected to the pin to control movement of the pin into and out of the circle described by the rotation of the projection on the rotary member and to control actuation of the press, whereby the control means prevents reactivation of the press when the projection strikes against the pin; an oil pressure chamber defined in the cylinder to produce an oil pressure therein as the piston slidably moves within the cylinder; and a plurality of orifices formed in the side wall of the oil pressure chamber to be closed in turn as the piston slidably moves within the cylinder.

**4,129,072**

## ELECTROSTATIC PRINTING

**Motoharu Fujii, Tokyo; Takao Muramatsu, Yokohama; Noboru Koumura, Tokyo; Susumu Sugiura, Yamato; Nobuhiro Takekawa, Tokyo, and Syusei Tsukada, Sagamihara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Jan. 21, 1977, Ser. No. 760,941**
**Claims priority, application Japan, Jan. 26, 1976, 51-7744**
**Int. Cl.[2] G01D *15/06***
**U.S. Cl. 101—1** **3 Claims**



1. An electrostatic printing apparatus which comprises:
an electrostatic printing image carrier comprising essentially a dielectric medium having an electric resistance sufficient to hold a static charge and a layer composed essentially of silver image carried by the medium;
charging means for charging the dielectric medium with a static charge corresponding to the same;
developing means for developing with developing material the latent image formed on said image carrier corresponding to the static charge;
cleaning means for cleaning the surface of the image carrier after charging and before developing, said cleaning means being provided within said developing means so that the developing material removed from the image carrier by said cleaning means is redeposited in said developing means; and
transferring means for transferring the image developed on the dielectric medium from said image carrier to a transfer material.

---

**4,129,073**

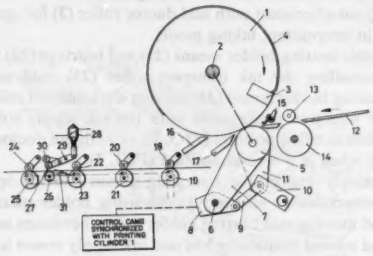
## DUPLICATOR MACHINE WITH MEANS FOR APPLYING TO THE COPIES DIFFERENT MARKINGS

**Gerhard Ritzerfeld, Schorlemer Allee 14, 1000 Berlin 33, Fed. Rep. of Germany**

**Continuation of Ser. No. 641,019, Dec. 15, 1975, abandoned. This application Sep. 6, 1977, Ser. No. 830,441**
**Claims priority, application Fed. Rep. of Germany, Dec. 20, 1974, 2461048**
**Int. Cl.[2] B41F *7/00***
**U.S. Cl. 101—2** **29 Claims**

1. In a duplicator machine of the type operative for wholepage, paragraphwise or sectionwise copying of printing, and the like, on originals, printing forms, and the like, and operative for producing corresponding copies intended to be differently routed, particularly to different clerical departments and the like, the machine being of the type wherein transport means transports the copies through the machine along a predetermined path in a predetermined direction, controllable marking means operative for providing the copies with differently colored routing markings which can be used for distinguishing among the copies as to their purpose and for properly

routing the copies, the controllable marking means comprising a plurality of printing cylinders, means for applying to respective ones of the printing cylinders inks of different respective colors which when applied to the copies are visible over the copied information on the copies, and means mounting each printing cylinder for rotation and for swinging movement




independently of the other printing cylinders between an inoperative position in which the printing cylinder does not contact the copies and an operative position in which the printing cylinder contacts the copies and rolls upon the surface of the copies producing solid stripes of the respective color extending in said predetermined direction and constituting routing markings.

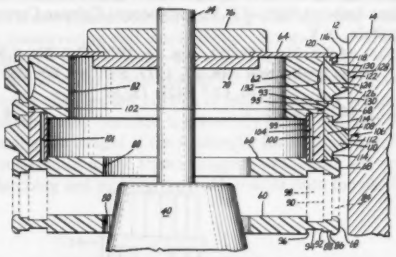
---

**4,129,074**

## MULTI-LINE IMPRINTING WHEEL APPARATUS

**Millard B. Beaver; Leonard L. Johnson; Harry L. Hart, and Tennis Mahoney, all of Fort Wayne, Ind., assignors to Lincoln Logotype Co., Inc., Fort Wayne, Ind.**

**Filed Jan. 3, 1977, Ser. No. 756,398**
**Int. Cl.[2] B41F** *17/00, 13/10*
**U.S. Cl. 101—35** **19 Claims**



1. A multi-line imprinting wheel comprising: a plurality of longitudinally spaced annular members coaxial with a longitudinally extending shaft, said annular members having peripheral edges and defining at least two annular, radially outwardly facing openings between adjacent pairs thereof; a plurality of type elements formed of rubber-like material each forming a line of type, each said type element including a base portion having opposite edges and an inner surface, and a printing portion joined to said base portion and having a printing face; each said adjacent pair of annular members having first means thereon for removably seating and retaining said opposite edges of said base portion of a said type element with said base portion thereof extending across the respective opening and said printing portion extending radially outwardly therein and with said printing face projecting radially beyond the peripheral edges of the respective pair of annular members; a plurality of annular resilient back-up members each having axially spaced opposite edges and an outer surface, each back-up member being in the form of a single, solid element of resilient material; each said adjacent pair of annular members having second means thereon in the form of facing radial surfaces and annular shoulders radially inwardly from said first means which are abuttable with the opposite edges and portions of the outer surface of a said resilient member for seating the latter with said resilient member extending across the respective opening and with its remaining portion of said outer surface engaging said inner surface of the respective type element; each said resilient member being resiliently radially movable inwardly with said outer surface thereof engaged with said inner surface of said type element being capable of both radial and tilting movement, each said resilient member resiliently resisting inward and tilting movement of the respective type element whereby each line of type is independently capable of limited radial and tilting movement for imprinting in parallel paths on an irregular surface.

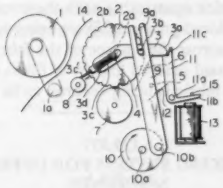
---

**4,129,075**

## LINE PRINTER

**Katsuhiko Okabe, Tokorozawa, Japan, assignor to Copal Company Limited, Tokyo, Japan**

**Continuation of Ser. No. 698,204, Jun. 21, 1976, abandoned.**
**This application Nov. 4, 1977, Ser. No. 849,113**
**Claims priority, application Japan, Jun. 23, 1975, 50-77372**
**Int. Cl.[2] B41J** *3/46, 29/26*
**U.S. Cl. 101—99** **2 Claims**



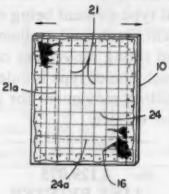
1. In a line printer having a printing mechanism comprising a plurality of coaxially arranged rotatable printing rings each bearing on the periphery thereof a series of characters to selectively effect printing on a paper, a platen movable toward the printing rings to abut thereagainst with the paper interposed therebetween and away therefrom so as to free the paper and permit the paper to be advanced, means for selectively and temporarily arresting each printing ring so as to locate a selected character in a printing position at which the platen abuts against the respective printing rings for simultaneously printing a line of printing on the paper by the selected characters, the improvement comprising additional printing means for selectively and additionally printing a mark adjacent particular characters printed on the paper, the additional printing means being movable from a retracted position to a printing position for effecting the additional printing, and means supporting said additional printing means for pivotal movement along the outer periphery of the printing rings, said additional printing means comprising a printing wire having portions supported by a pair of printing levers each swingably supported adjacent opposite extremities of the coaxially arranged printing rings, spring means for biasing the pair of printing levers so as to urge the printing wire to the printing position, arresting levers means releasably engageable with the pair of printing levers, respectively, so as to arrest the printing wire in the retracted position against the action of the spring means, solenoid means cooperating with the arresting lever means for releasing the arresting lever means from the printing levers, and charging lever means for urging the printing levers, so as to permit the arresting lever means to arrest the printing levers in the retracted position of the printing wire, and rotatable cam means operably coupled with the charging lever means for discharging the charging lever means to to urge the printing levers to retract position so as to be arrested by the arresting lever means.

**4,129,076**

## COLOR-KEYED FABRIC FOR SCREEN PRINTING

**Robert F. Gardner, 5505 Hawthorne Dr., Indianapolis, Ind. 46226**

**Filed Dec. 7, 1977, Ser. No. 858,360**
**Int. Cl.[2] B41F** *15/36*
**U.S. Cl. 101—127** **3 Claims**




1. A mesh fabric for use in screen printing having threads or fibers uniformly spaced to provide a mesh screen through which printing ink is forced during the printing process, the fabric being secured evenly and drum-tight to a rigid printing frame and means for monitoring and thereby controlling distortion of the fabric as it is tightened over the frame, said means consisting of certain groups of one or more adjacent parallel fibers having a color contrasting with the overall color of the fabric and said colored groups of fibers being uniformly spaced from each other across the surface of the fabric, whereby the spacing between said colored groups of fibers may be visually monitored as the fabric is being secured to its printing frame.

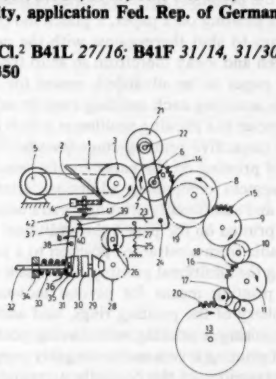
---

**4,129,077**

## DUAL FEED INKING SYSTEM FOR OFFSET PRINTING MACHINES

**Hermann Fischer, Augsburg, Germany, assignor to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft (M.A.N.), Augsburg, Germany**

**Filed Jan. 27, 1978, Ser. No. 872,891**
**Claims priority, application Fed. Rep. of Germany, Jan. 28, 1977, 2703424**
**Int. Cl.[2] B41L** *27/16;* **B41F** *31/14, 31/30*
**U.S. Cl. 101—350** **10 Claims**



1. Dual-mode inking system for offset printing machines having

a ductor roller (3) with an ink accepting surface;

means (1, 2) applying ink to the ink accepting surface of the ductor roller;

an ink train including a plurality of ink transport and transfer rollers (8, 9, 10, 11) transporting and transferring ink to the plate cylinder (13) of the printing machine,

and comprising, in accordance with the invention,

means to selectively apply ink from the ductor roller (3) to the ink train in either

(a) continuous mode, or

(b) intermittent mode, including

an ink supply roller (6);

an ink transport roller (21);

movable bearing means (7) journalling the ink supply roller (6) for ink transferring surface contact with at least one of the rollers (8) of the ink train and, selectively,

(a) in continuous contact with said ductor roller (3) for operation in continuous inking mode, or

(b) out-of-contact with said ductor roller (3) for operation in intermittent inking mode;

movable bearing holder means (23) and bearings (22) therein journalling the ink transport roller (21), said movable bearing holder means (23) moving the transport roller (22) for selective engagement with the ink supply roller (6) when in a first position (FIG. 2), or with the ductor roller (3) when in a second position (FIG. 3);

selectively engageable operating means (26-36) operably connectable to said movable bearing holder means (23) and moving said bearing holder means betweeen said first and second positions when said ink supply means is operable in intermittent mode (b);

and variable speed drive means (5) connected to the ductor roller (3) to drive the ductor roller, selectively, when

(a) the ink supply means operate in continuous mode, at a speed at which the surface speed of the ductor roller (3) and the surface speed of the plate cylinder (13) are approximately matched; and

(b) the ink supply means operate in intermittent mode, at a speed at which the surface speed of the ductor roller (3) is less than the surface speed of the plate cylinder (13).

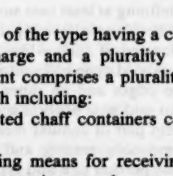
---

**4,129,078**

## DISPERSIVE SUBPROJECTILES FOR CHAFF CARTRIDGES

**Clayton J. Schneider, Jr., East Aurora, and Ernest V. Ruda, East Amherst, both of N.Y., assignors to Calspan Corporation, Buffalo, N.Y.**

**Division of Ser. No. 695,283, Jun. 11, 1976, Pat. No. 4,063,515. This application Jun. 27, 1977, Ser. No. 809,968**
**Int. Cl.[2] F42B** *13/56*
**U.S. Cl. 102—89 CD** **6 Claims**




1. In a chaff cartridge of the type having a casing, a primer, a fuse, a propellant charge and a plurality of chaff fibers wherein the improvement comprises a plurality of chaff subprojectiles each of which including:

a plurality of segmented chaff containers containing chaff fibers;

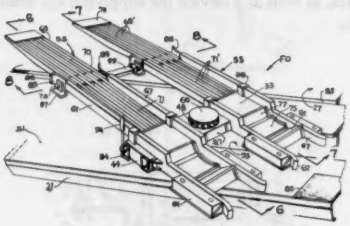
prestressed retainer ring means for receiving and holding together said chaff containers; and

drag producing means for separating said subprojectiles and converting forward motion to rotational motion and for causing said subprojectiles to rotate and thereby produce centrifugal forces which cause said prestressed retainer rings to rupture causing said chaff fibers to be radially dispensed with respect to said subprojectiles upon the firing of said chaff cartridge due solely to centrifugal and inertial forces.

## 4,129,079
## RAILROAD CAR FOR HIGHWAY TRAILERS

Montague W. Shannon, 2121 Bragg St., Lot 1, Chamblee, Ga. 30341

Filed Jul. 7, 1977, Ser. No. 813,484
Int. Cl.[2] B65G 67/02
U.S. Cl. 105—368 B 9 Claims



1. In transporting apparatus including a railroad car having frame structure extending lengthwise of the car and highway vehicle means including a semitrailer having load bearing structure and highway wheel means supporting the rearward portion of said load bearing structure, and including a truck-tractor, and means hitching the truck-tractor to said semitrailer; the means for loading the semitrailer onto said car comprising platform means disposed alongside said car, supporting said highway vehicle means, runner means operationally supported on the frame structure of said car, turnable laterally and shiftable longitudinally of the frame structure, means turnably adjusting said runner means laterally of the car frame structure with distal portions thereof disposed contigious said platform means, first means for maneuvering said highway vehicle means, moving said semitrailer backward and said wheel means onto said runner means, means for limiting the movement of said wheel means relative to said runner means, second means for maneuvering said highway vehicle means, maneuvering said truck-tractor backward and progressively angular relative to the semitrailer, actuating said runner means laterally and longitudinally of the car frame structure and moving the forward portion of said semitrailer to a disposition substantially centered transversely of the car, means for transferring the weight of the semitrailer forward portion from said truck-tractor to the frame structure of the car, and means for unhitching and moving the truck-tractor onto the platform means.

---

## 4,129,080
## SHELF SUPPORT DEVICE

Seymour Vall, 35 W. 81 St., New York, N.Y. 10024

Filed Mar. 28, 1977, Ser. No. 781,550
Int. Cl.[2] A47B 5/00
U.S. Cl. 108—149 7 Claims

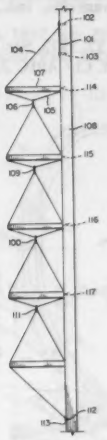
1. A shelf support device comprising in combination a plurality of components including:

A. a plurality of strap means each arranged in two strands and providing direct support for a plurality of shelves;

B. hanger means anchored to a vertically extending support, said hanger means supporting a first end of each of said strands of said strap means;

C. sling lock means located at spaced intervals along said strands, said sling lock means locking said strands in place to provide support for each said shelves; and,

D. sling lock keeper means so arranged and constructed to anchor the second end of each said strap means to said support; whereby the non-rigid materials comprising said



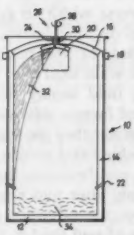
shelf support device are so arranged and constructed to become rigid when stressed.

---

## 4,129,081
## ROTARY INJECTOR FOR LIQUID RESIDUE INCINERATING FURNACE

Bernard Baudin, Paris, France, assignor to Etablissements P. Ferbeck & Vincent, Velizy-Villacoublay, France

Filed Sep. 22, 1977, Ser. No. 835,612
Claims priority, application France, Oct. 4, 1976, 76 29773
Int. Cl.[2] F23G 5/12
U.S. Cl. 10—238 5 Claims

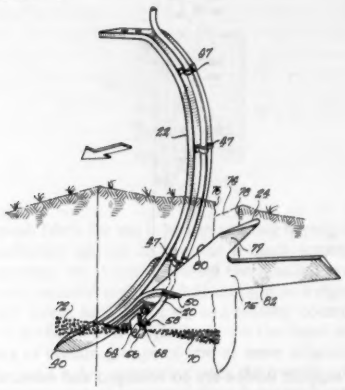


1. In a vertical cylindrical furnace for incinerating liquid residues, a rotary injector for injecting the residues to be dried on the wall of said furnace, comprising, an injection pipe and an injection nozzle, a nozzle-holder and an intermediate elbow between the injection pipe and said nozzle-holder, the nozzle-holder itself being bent and adapted to cooperate with the intermediate elbow with respect to which it is adjustable in rotation, so as to be able to give a determined orientation to the injection nozzle, so that the liquid to be incinerated covers an optimal drying surface on the cylindrical wall for any flow within a given range of variation; a sliding ring adapted to apply the nozzle-holder on the elbow in the extension one of the other, stopped in rotation with respect to the elbow, a shouldered nut adapted to stop the nozzle-holder in rotation with respect to the elbow.

## 4,129,082
## EARTH WORKING AND FLUID DISTRIBUTION APPARATUS

Gilbert E. Betulius, Evansville, Ind., assignor to Chem-Farm Inc., Evansville, Ind.

Filed Jan. 12, 1977, Ser. No. 758,588
Int. Cl.[2] A01C *23/02*
U.S. Cl. 111—7 4 Claims



1. An earth working and fluid distribution apparatus comprising a mobile plow including a rigid frame, soil grooving and fracturing means including shank means attached to said frame and a tool having a leading edge attached to said shank means with a transverse width defined by the horizontal distance between the vertical edges thereof for creating a furrow in communication with the soil as said mobile plow travels thereacross, fluid supply means attached to said frame, fluid distribution means connected to said fluid supply means, said fluid distribution means terminating in fluid discharge means connected to said shank means above and behind the leading edge of said tool, said fluid discharge means having opposed nozzle means for discharging fluid substantially laterally against opposed sidewalls of said furrow created by said soil grooving and fracturing means, rearwardly diverging sweep means connected to said shank means and having a leading portion having a transverse width no greater than said transverse width of said tool disposed substantially directly above the fluid discharge means to prevent positive disturbance of the tool created furrow side walls until after said nozzle means has passed thus facilitating fluid issuing from the nozzle means reaching the tool created furrow side walls, said sweep means diverging to a width greater than the transverse width of said tool behind and only behind said nozzle means and extending above and behind said nozzle means for contacting the sidewalls of said furrow only after said nozzle means has passed and displacing soil from the sidewalls of the furrow downwardly to effect sealing of said fluid in the soil following said discharge of said fluid.

---

## 4,129,083
## JOINING OF A MULTIPLE-LAYER FABRIC BY INVISIBLE STITCHING

Robert E. Vinner; Max Parisot, and Jacques Parisot, all of 53-55, rue d'Avron, Paris 20, France

Filed Jun. 27, 1977, Ser. No. 810,059
Claims priority, application France, Jul. 22, 1976, 76 22381
Int. Cl.[2] D05B *1/24*
U.S. Cl. 112—178 8 Claims

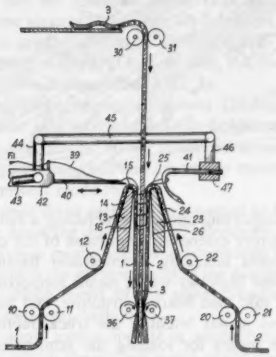
1. In a machine for joining together a plurality of layers of fabric by invisible stitching, of the type comprising:

a sewing station where two acute-angled guides having ridges are disposed side by side to offer two adjacent, rectilinear and parallel ridges,

two fabric dispensing devices, supplying two strips of fabric on either side of the two guides,

a step-by-step drive device adapted to pull the two strips of fabric jointly over the ridges of the guides and thence between the two guides, the combination of:

a needle-holder carriage, holding a plurality of needles movable so that the needles penetrate the thickness of the strips of fabric when said latter rest on said ridges of the guides, as well as a device for supplying the needles with yarn,



a hook-holder bar holding a plurality of hooks and homologous with the needle-holder carriage, pivoting with the movement of the carriage in order to allow a chain-stitch, and

a control allowing alternately the movement of the needle-holder carriage and of the hook-holder bar to make a series of stitches, and the movement of the drive device for advancing the fabric.

---

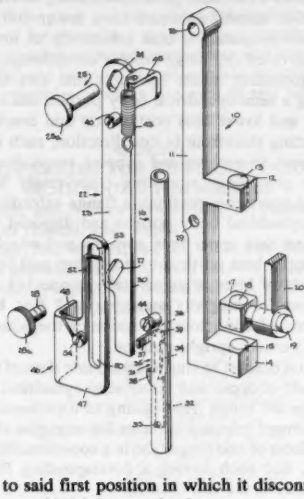
## 4,129,084
## NEEDLE BAR DISENGAGING DEVICE FOR SEWING MACHINES

Yoshio Kihara, Sakai, Japan, assignor to Sanwa Industries, Ltd., Osaka, Japan

Filed Apr. 4, 1977, Ser. No. 784,141
Claims priority, application Japan, Apr. 12, 1976, 51-40720; Sep. 29, 1976, 51-131083[U]
Int. Cl.[2] D05B *55/16*
U.S. Cl. 112—221 17 Claims

1. In a sewing machine having a frame, a needle bar mounted for endwise reciprocating motion in said frame, a driving mechanism for effecting endwise reciprocation of said needle bar, a latch mechanism for selectively connecting and disconnecting said driving mechanism with and from said needle bar, and a latch release member supported on said frame for movement alternately into and out of a position for releasing said latch mechanism, the improvement wherein said needle bar has a recess therein extending in the direction of the extending transversely to the direction of endwise reciprocation of said needle, and wherein said latch mechanism has a latch element mounted in said recess for movement in said recess from a first position in which it extends outwardly of said needle bar and

connects said needle bar to said driving mechanism to a second position disposed in a direction inwardly of said needle bar



with respect to said first position in which it disconnects said needle bar from said driving mechanism.

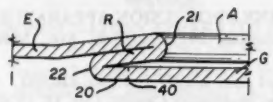
---

**4,129,085**

## GATED CAN END WITH SHEAR OFFSET DEFINING GATE AND METHOD FOR MANUFACTURE OF THE SAME

**Gerald B. Klein, 13451 Stuart Ct., Broomfield, Colo. 80020**

**Filed Mar. 7, 1977, Ser. No. 774,596**
**Int. Cl.² B21D *51/44***
**U.S. Cl. 113—121 C** **3 Claims**




1. The method of forming a can lid blank having a pushdown gate in a panel portion of the lid below an aperture in the lid, with a narrow spacing rim underfolded about the aperture whose outward edge joins with the panel portion therebelow, and including the steps of: drawing a cup downwardly in the lid blank having a bottom area approximating said panel portion; drawing a ridge upwardly from the lid blank whose inner wall forms the wall of said cup; forming said panel portion in the bottom of the cup; cutting a frangible discontinuity in the formed panel portion adjacent to the ridge to define the outline of the gate therein, said frangible discontinuity being formed by the operations of shifting the gate downwardly from the plane of the panel to form an offset shear extending partially through the panel and returning the gate towards the plane of the panel; and folding the ridge inwardly and downwardly to overlie the frangible discontinuity and form said aperture.

**4,129,086**

## METHOD AND MEANS FOR THE ACOUSTICAL STEERING OF SUBMARINE TORPEDOES

**Hans-Dieter Schwarz, Am Querkamp 58, 28 Bremen, Fed. Rep. of Germany**

**Filed Dec. 4, 1967, Ser. No. 689,748**
**Claims priority, application Fed. Rep. of Germany, Dec. 24, 1966, 9046565**
**Int. Cl.² F42B *19/01, 19/10;* G05D *1/00***
**U.S. Cl. 114—23** **14 Claims**

1. A method of steering a submarine torpedo towards a target in which the bearing of the target from the torpedo is determined acoustically and the steering connected according to the relative position of the target with respect to the torpedo and the target position thus determined which method includes the steps of,

raising and lowering the speed of said torpedo during alternating mutually exclusive high and low speed intervals respectively,

measuring the distance between said torpedo and a target during each slow speed interval,

shortening the duration of said slow speed intervals in response to sensing a target,

and correcting the steering of said torpedo in response to the distance measurements, thereby to move said torpedo along a collision course with said target.

---

**4,129,087**

## COMBINATION PURSUIT AND COMPENSATORY DISPLAY SYSTEM

**Joseph G. Dimmick; William J. Weingartner, both of Annapolis; Alan S. Fields, Silver Spring; Donald L. Fairhead, Annapolis, and Rosemary Musson, Millersville, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Aug. 19, 1977, Ser. No. 826,019**
**Int. Cl.² B63H *25/04***
**U.S. Cl. 114—144 E** **17 Claims**

1. An automated system for assisting a human operator to adjust a machine control parameter in an optimal manner comprising;

a computing means for repetitively calculating an optimum ordered value of the control parameter;

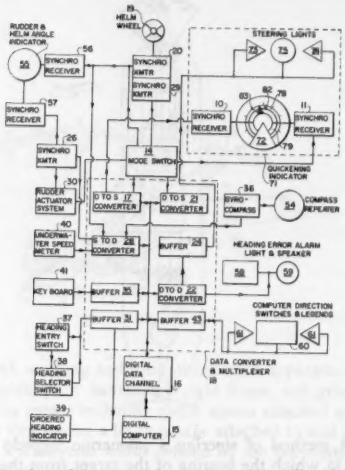
sensor means for providing the computing means with the data needed to calculate the control parameter;

control means adjustable by the operator to directly and continuously set an ordered value of the control parameter;

a display means, including a compensatory display and a pursuit display, for continuously presenting to the opera-

tor the most recently calculated optimum ordered value of the control parameter, the ordered value of the control parameter set by the operator, and the direction and significance of the error between the optimum ordered value and the set ordered value of the control parameter;

said compensatory display including three indicators with each of the indicators having an excited state and an off state, an excited state on one indicator indicating that the calculated optimum ordered value of the control parameter is larger than the set ordered value, an excited state on a second indicator indicating that the calculated optimum




ordered value of the control parameter is smaller than the set ordered value, and an excited state on the third indicator indicating that the difference between the set ordered and the calculated optimum ordered values of the control parameter is not significant, only one of the three indicators being exited at a time;

said pursuit display including a calibrated dial with two cursors movable along the dial, with the position of one cursor indicating the calculated optimum ordered value of the control parameter and the position of the other cursor indicating the set ordered value of the control parameter.

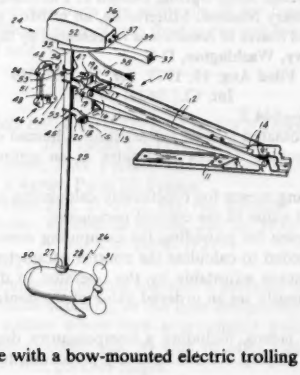
---

**4,129,088**

## DIVIDED CAP HINGE BRACKET

**John D. Foley, Jr., Shreveport, La., assignor to Ram-Trol, Inc., Bossier City, La.**

**Filed Apr. 27, 1977, Ser. No. 791,171**
**Int. Cl.[2] B63H *15/12***
**U.S. Cl. 115—18 E** **1 Claim**



1. For use with a bow-mounted electric trolling motor unit of the type comprising an elongate cylindrical hinge tube extending downwardly from a control head and through which extends a rotatable pivot tube having an electric motor and propeller assembly carried on a lower end thereof for steering and propelling a boat selectively at low speed, an improved divided cap hinge bracket comprising:

a bow mounting means having a first cast bracket part, having a semi-cylindrical body portion and spaced apart upper and lower boss portions on said bracket part and projecting therefrom in one direction, each boss portion apertured to receive and support respective upper and lower pivot pins extending transversely between the spaced apart boss portions, a flange extending from said semi-cylindrical body portion and disposed transversely between said upper boss portions and attached to each said upper boss portion, to strengthen said bracket,

a plurality of lever arms pivotally connected to said boss portions for hingedly swinging said first bracket part between a folded storage position on the bow of said boat and a vertical upright position,

said first bracket having a second side thereof formed with a pair of upper and lower semi-cylindrical mating surfaces left rough from casting to form serrated abrasive abutment gripping surfaces for engaging the adjoining surfaces of said hinge tube in a non-rotatable firm assembly, and each having a corresponding flat abutment surface at the end thereof,

studs affixed in said first bracket part and each projecting out of one of said flat abutment surfaces in a direction opposite to said one direction, a second cast bracket part also having corresponding flat abutment surfaces,

said second bracket part apertured at said corresponding flat abutment surfaces and receiving said studs, nuts received on said studs over said second bracket part for selectively clamping the parts together in assembly about said hinge tube with the respective upper and lower serrated abrasive surfaces defining a cylindric bore for clampingly engaging the hinge tube, said bore having a slightly smaller diameter than said hinge tube such that a small gap exists between said flat abutment surfaces of said first bracket part and said second bracket part when said hinge tube is within said bore and said nuts are fully tightened on said studs,

whereby the pivot tube may be selectively assembled with and removed from the hinge bracket without disassembly of the control head or the electric motor and propeller assembly.

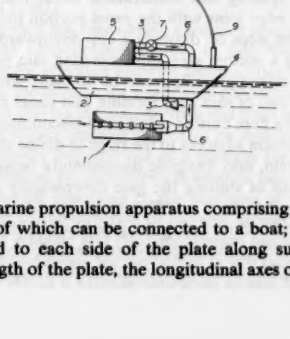
---

**4,129,089**

## MARINE PROPULSION APPARATUS

**Michael P. Paidoussis, 241 Brookfield Ave., Mount Royal, Canada**

**Filed Aug. 1, 1977, Ser. No. 820,603**
**Claims priority, application Canada, Oct. 18, 1976, 263570**
**Int. Cl.[2] B63H *1/30***
**U.S. Cl. 115—28 A** **1 Claim**



1. A marine propulsion apparatus comprising a flexible plate one end of which can be connected to a boat; a flexible tube connected to each side of the plate along substantially the entire length of the plate, the longitudinal axes of the tubes and

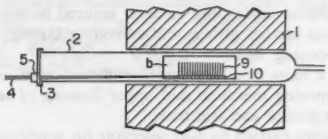
plate being parallel and defining a plane perpendicular to the sides of the plate; pump means for causing water to flow through the tubes at a sufficiently high velocity to produce undulation of the plate and tube along substantially the entire length thereof for propelling the boat; and coupler means in fluid communication with said pump means and attached to the leading end of said tubes for simultaneously directing substantially equal quantities of water into each of said tubes.

---

## 4,129,090
## APPARATUS FOR DIFFUSION INTO SEMICONDUCTOR WAFERS

**Keizo Inaniwa, and Noboru Ryugo, both of Takasaki, Japan, assignors to Hitachi, Ltd., Japan**

**Division of Ser. No. 446,791, Feb. 28, 1974, Pat. No. 3,948,696.**
**This application Apr. 5, 1976, Ser. No. 673,535**
**Claims priority, application Japan, Feb. 28, 1973, 48-23208**
**Int. Cl.[2] C23C** *13/08*
**U.S. Cl. 118—49** **19 Claims**




1. An apparatus for treating semiconductor wafers comprising an elongated furnace tube having first and second openings, detachable closure means provided at said first opening for furnace tube having first and second openings, detachable closure means provided at said first opening for sealing said first opening, first supporting means for placing substantially erect semiconductor wafers into said tube to extend serially in a group along the axis of said tube and for arranging at least one boron nitride source substantially vertically relative to said semiconductor wafers in said tube and spaced from, but adjacent to, said semiconductor wafers without contacting the inner surface of said tube, means connected to said second opening for reducing pressure in said tube below atmospheric pressure, and means for heating said semiconductor wafers and boron nitride source so as to deposit boron impurity on surfaces of said semiconductor wafers from the boron nitride source under the pressure-reduced state, wherein said boron nitride source comprises at least one boron nitride wafer.

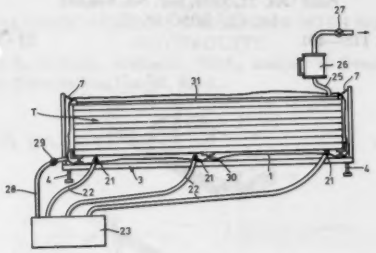
---

## 4,129,091
## IMPREGNATION APPARATUS HAVING BIAS-OPENING MEANS

**James R. France, 3 Strine Way, Newport, Shropshire; John D. Buchan, Balshaw Fold, under Billinge La., Blackburn, Lancashire; Richard G. Tyrer, 10 North Dunes, Hightown, Liverpool, L38 OBJ, all of England; Adolf De Ceuleneer, Elisabethlaan, 88, 2600 Berchem, Antwerpen, and Robert Van Steenkiste, Eric Jameslaan, 7, B.8370, Blankenberge, both of Belgium**

**Filed Jan. 9, 1978, Ser. No. 868,210**
**Claims priority, application United Kingdom, Jan. 10, 1977, 709/77; Nov. 11, 1977, 47987/77**
**Int. Cl.[2] B05C** *9/10, 11/11*
**U.S. Cl. 118—50** **12 Claims**

1. Apparatus for use in impregnating with an impregnant in a liquid or semi-liquid state at least one body made at least in part of organic fluid-permeable material comprising a substantially rigid support structure; a receptacle of flexible fluid-impermeable material supported by the rigid structure, which receptacle has an opening for introduction into the receptacle of said body or bodies, extensible means securing the receptacle to the rigid structure and urging the receptacle opening into the open position for introduction through said opening of said body or bodies, said receptacle including integral means for securing boundary edges of said opening together against the action of said extensible means to effect a substantially fluid-tight seal; at least one outlet in the receptacle through



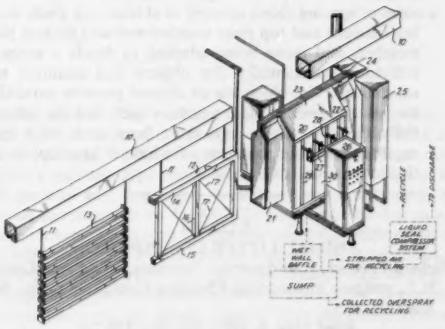

which air and any other fluid can be evacuated from within the receptacle; and at least one inlet in the receptacle through which impregnant in a liquid or semi-liquid state can be introduced in to the receptacle.

---

## 4,129,092
## APPARATUS FOR SPRAY COATING

**Richard F. Wiggins, Fairfield, Conn., assignor to Gyromat Corporation, Bridgeport, Conn.**

**Division of Ser. No. 637,019, Dec. 2, 1975, Pat. No. 4,042,734.**
**This application Apr. 22, 1977, Ser. No. 789,882**
**Int. Cl.[2] B05C** *5/00, 15/00*
**U.S. Cl. 118—323** **4 Claims**




1. An apparatus for spray coating of workpieces, which comprises

(a) a spray housing forming a substantially enclosed spray chamber,

(b) means for conveying workpieces through said chamber and along an axis,

(c) means in said chamber for reciprocating a coating material spray nozzle along a first axis at a substantial angle to said axis of conveyance,

(d) means mounting said spray nozzle for at least partial rotation about a second axis which is at a substantial angle to said axis of conveyance and mounting said nozzle at a substantial angle to said second axis, and

(e) means for rotating said spray nozzle during reciprocation thereof,

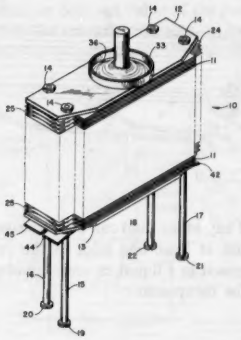
(f) said spray nozzle being rotated at a rate, in relation to the speed of reciprocation and speed of conveyance, that coating material spray discharged from said spray nozzle describes tight curtate cycloids in which the effective ratio of rolling circle radius to tracing point radius (a/b) is one to at least about five.

**4,129,093**

## STAINING APPARATUS

**Leighton C. Johnson, Edwardsburg, Mich., assignor to Miles Laboratories, Inc., Elkhart, Ind.**

**Filed Oct. 11, 1977, Ser. No. 840,651**
**Int. Cl.[2] B05C *13/02***
**U.S. Cl. 118—401** **13 Claims**



1. Apparatus for holding a plurality of individual substantially flat objects parallel to each other and separated from each other by a capillary gap, which apparatus comprises:

a top plate member having at least one opening adapted for the introduction of liquid along at least one edge of said substantially flat objects;

a movable bottom plate member;

at least one guide member interconnecting said top plate member with said bottom plate member; and

a series of spacing shims adapted to at least one guide member between said top plate member and said bottom plate member, said shims being adapted to divide a series of individual substantially flat objects and maintain said substantially flat objects in an aligned position parallel to the top and bottom plate members such that the substantially flat objects are kept apart from each other by a capillary gap, the thickness of which is identical to the thickness of one of the shims.

---

**4,129,094**

## ANIMAL LITTER COMPOSITION

**Richard F. Stockel, Bridgewater Township, Middlesex County, N.J., assignor to American Chemical Consulting Corp., New Rochelle, N.Y.**

**Filed Mar. 9, 1977, Ser. No. 775,730**
**Int. Cl.[2] A01K *29/00***
**U.S. Cl. 119—1** **11 Claims**

1. A method of deodorizing cat litter which comprises adding an effective quantity of a cat litter composition to said cat litter, said cat litter composition being selected from the group consisting of fly ash, bottom ash, boiler slag and mixtures thereof.

---

**4,129,095**

## SELF-AERATING CONTAINER

**Thomas G. Roberts, 2815 Bentley, Huntsville, Ala. 35801; Charles M. Rust, 6511 Sheri Dr., Huntsville, Ala. 35806, and Norman M. Witriol, 2501 Lancelot Dr., Huntsville, Ala. 35803**

**Filed Dec. 20, 1976, Ser. No. 752,785**
**Int. Cl.[2] A01K *63/00, 97/04***
**U.S. Cl. 119—5** **6 Claims**

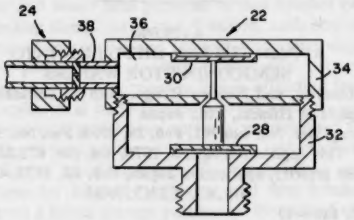
1. A self-aerating container comprising:

(a) a tank for holding water;

(b) a reservoir for holding air;

(c) control means comprising:

(1) a pressure regulator including an upper and lower housing, said lower housing having an inlet means connected to said reservoir and an upper plate secured therewith having an outlet opening therein, a first flat spring member having openings therethrough secured over said inlet, said upper housing being in threaded relation with said lower housing and having a second flat spring member secured to the inner surface thereof,




and an upstanding member secured between said first and second springs and extending through said outlet opening, and

(2) a mass flow regulator connected between an outlet opening means in said upper housing of said pressure regulator and said tank;

(d) means carried by said reservoir for supplying air thereinto.

---

**4,129,096**

## SOW FEEDING ENCLOSURE

**Lonnie L. Nickel, Rte. #1, Tampa, Kans. 67483**

**Filed Jan. 7, 1977, Ser. No. 757,658**
**Int. Cl.[2] A01K *1/02***
**U.S. Cl. 119—27** **5 Claims**

1. A sow feeding enclosure comprising:

a. a frame defining a stall having side walls and being open at both forward and rearward ends,

b. a feed bunker mounted within said stall,

c. front and rear doors pivoted on said frame and adapted when in closed positions to obstruct the front and rear openings of said stall respectively,

d. door locking means operable to lock said doors in their closed positions, and

e. manually operable door operating means operable to lock, unlock, open and close each of said doors independently of the other, said front door being pivoted to said frame at its upper edge on a horizontal transverse axis, and opening outwardly and upwardly said locking and operating means for said front door comprising a horizontally extended lock bar carried for vertical movement by said front door, and projecting laterally from said door to engage said frame to limit closure of said door, keepers fixed to said frame and engageable with said lock bar to lock said door closed, said lock bar being engageable and disengageable from said keepers by vertical movement of said lock bar relative to said door, spring means biasing

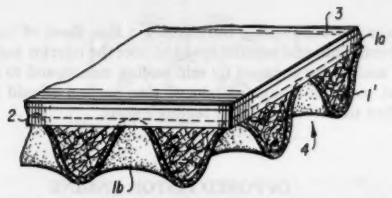
said lock bar vertically relative to said door to engage said keepers, and a handle affixed to said lock bar, whereby said lock bar may be disengaged from said keepers by vertical pressure on said handlle, and said door opened by pulling outwardly on said handle.

---

**4,129,097**
**FLOOR COVERING SHEET FOR STABLES**

**Udo Schwartzkopff, and Horst Fischer, both of Wuppertal, Germany, assignors to Akzona Incorporated, Asheville, N.C.**

**Filed Mar. 3, 1977, Ser. No. 773,932**
**Int. Cl.[2] A01J *1/00*; B32B *27/06***
**U.S. Cl. 119—28** **7 Claims**



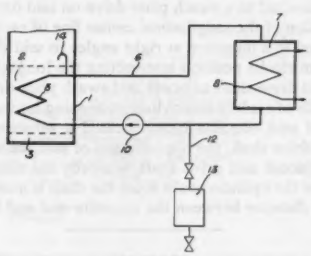

1. In structural combination with a stable floor for animals, a soft and resilient floor covering sheet comprising a highly porous, compressible sublayer in placement on said floor and a polymeric top layer which is impermeable to moisture, said compressible sublayer consisting essentially of a matting sheet composed of continuous, looped synthetic polymeric filaments intersecting one another and fused at their points of intersection, said filaments having a diameter of 0.4 to 2.5 mm, said matting having in its normal non-compressed state a porosity exceeding 90% with its porous structure being sufficiently open to prevent any accumulation of capillary moisture, and the upper face of said matting being at least partly embedded in said impermeable top layer.

---

**4,129,098**
**FLUIDIZED BEDS**

**John W. E. Campbell, London, England, assignor to Babcock & Wilcox Limited, London, England**

**Filed May 20, 1977, Ser. No. 799,004**
**Claims priority, application United Kingdom, May 21, 1976, 21050/76**
**Int. Cl.[2] F23D *19/02*; F22B *1/02***
**U.S. Cl. 122—4 D** **8 Claims**



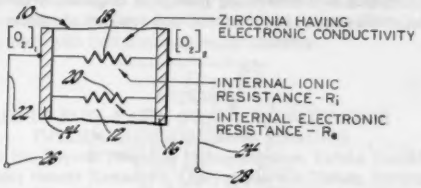

1. Fluid heating apparatus including a fluidized bed furnace, an intermediate heat transfer loop comprising a heat absorption section disposed within the fluidized bed and a further section, a heat exchanger providing two flow paths of which the first is said further section, means by which a fluid to be heated may be passed through the second of said flow paths, means by which a stream of fine solid material may be circulated through the loop in a stream of gas, and a bleed pipe leading from the loop through which fine solid material circulating through the loop may discharge.

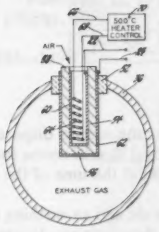
---

**4,129,099**
**GALVANIC EXHAUST GAS SENSOR WITH SOLID ELECTROLYTE**

**David S. Howarth, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.**

**Filed Apr. 15, 1977, Ser. No. 787,900**
**Int. Cl.[2] G01N *27/46***
**U.S. Cl. 123—32 EE** **7 Claims**




1. An internal combustion engine assembly comprising a spark ignition internal combustion engine, means defining an exhaust passage for directing exhaust gases emitted from said engine, a galvanic-type sensor exposed to said exhaust gases in said passage and responsive to exhaust gas constituents at various temperatures up to 900° C., said sensor having as an active element an oxygen ion conductive solid oxide electrolyte effective to produce an output voltage that is representative of exhaust gas chemical contact, said electrolyte having a fluorite-type crystal matrix doped with at least one electronic conductivity-inducing dopant selected from the group consisting of iron oxide, manganese oxide and cerium oxide that provides a temperature dependent electronic conductivity therein, said dopant induced electronic conductivity in sense and amount to provide a sensor output voltage substantially independent of temperature above a preselected temperature less than about 600° C., heating means for maintaining said sensor between said preselected temperature and 900° C. whereby sensor output voltage is substantially temperature independent, and means having a high internal electronic resistance responsive to the output voltage of said sensor.

---

**4,129,100**
**INTERNAL COMBUSTION ENGINE WITH AN AUXILIARY CHAMBER**

**Nobuo Habu, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan**

**Filed Jun. 6, 1977, Ser. No. 804,164**
**Claims priority, application Japan, Apr. 6, 1977, 52-38489**
**Int. Cl.[2] F02B *3/00***
**U.S. Cl. 123—32 L** **8 Claims**

1. An internal combustion engine comprising:
a cylinder block having a cylinder bore therein;
a cylinder head having a cavity therein and mounted on said

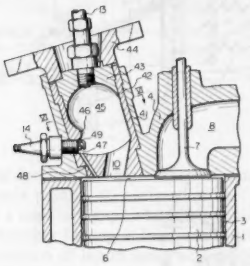
cylinder block, said cavity having an inner wall which defines an auxiliary chamber with an axis;

a piston reciprocally movable in said cylinder bore, said piston and said cylinder head forming a main chamber therebetween;

an intake valve movably mounted on said cylinder head for leading gas into said main chamber;

an exhaust valve movably mounted on said cylinder head for discharging exhaust gas into the atmosphere;

a connecting passage communicating said main chamber with said auxiliary chamber and arranged to be tangentially connected to the inner wall of said auxiliary chamber, the inner wall of said auxiliary chamber having a recess at a position located opposite to the inner wall to which said connecting passage is tangentially connected with respect to the axis of said auxiliary chamber;



a fuel injector having an injecting nozzle disposed in said auxiliary chamber and directed to said recess for forming a rich air-fuel mixture therein at the time of the compression stroke;

a spark having a central electrode and an earthing electrode which define a spark gap therebetween located in said recess for igniting the rich air-fuel mixture therein, said central electrode having a mounting end covered by an insulator, and;

passage means communicating said recess with said main chamber for leading the gas in said main chamber into the gas around said insulator at the time of the compression stroke to dilute a rich air-fuel mixture formed around said insulator.

---

**4,129,101**

## INTERNAL COMBUSTION ENGINE

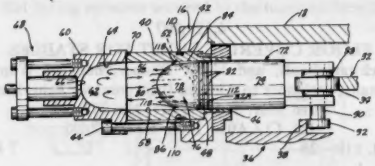
**Ray T. Townsend, Des Moines, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa**

**Division of Ser. No. 678,389, Apr. 19, 1976, and Ser. No. 576,198, May 9, 1975, abandoned, which is a continuation-in-part of Ser. No. 488,782, Jul. 15, 1974, abandoned, said Ser. No. 678,389, is a continuation-in-part of Ser. No. 488,781, Jul. 15, 1974, Pat. No. 3,967,599, which is a continuation of Ser. No. 351,606, Apr. 16, 1973, Pat. No. 3,828,740, which is a continuation-in-part of Ser. No. 286,189, Sep. 5, 1972, abandoned. This application Mar. 2, 1977, Ser. No. 773,597**

**Int. Cl.[2] F01P *1/04***

**U.S. Cl. 123—41.56** **4 Claims**

1. The method of protecting the sealing means on the piston of an internal combustion engine from the heat of combustion in an engine comprising an engine block means, a cylinder sleeve mounted in said block, a cylinder head mounted on one end of said sleeve and forming a combustion chamber at said one end of said sleeve, means for supplying a combustible fuel to said combustion chamber, a piston slidably mounted in said sleeve and movable between a compression position adjacent said cylinder head and an expansion position away from said one end of said sleeve; said piston having a top portion, an elongated central side portion and a lower portion and having a narrow annular space around the central side portion; sealing means on the lower portion of said piston which engages the interior wall surface of said sleeve, said elongated central side portion extending proportionately a substantial distance beyond said lower portion in a direction towards said head, the



invention comprising, introducing a thin sheet of cooling air directly into said annular space to cool the interior wall surface of said sleeve engaged by said sealing means, and to surround and cool the elongated central side portion of said piston to effect the cooling of said sealing means.

---

**4,129,102**

## OPPOSED PISTON ENGINE

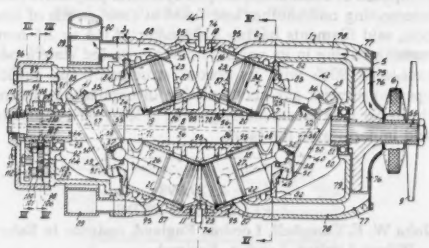
**Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland**

**Filed Feb. 23, 1976, Ser. No. 660,518**

**Claims priority, application Netherlands, Feb. 21, 1975, 7502062; Feb. 21, 1975, 7502063**

**Int. Cl.[2] F02B *25/08, 75/26***

**U.S. Cl. 123—51 B** **15 Claims**



1. An engine comprising a housing and an elongated straight drive shaft which extends substantially through said housing and is supported in said housing, a plurality of pistons with corresponding rods and cylinders positioned around said drive shaft and mounted to reciprocate in the same general direction as that shaft but non parallel thereto, outer ends of said rods being connected to a swash plate drive on said drive shaft, the prolongation of the longitudinal center line of each said piston rod viewed in a direction at right angles to said drive shaft in its medium stroke position intersecting the longitudinal center line of said drive shaft adjacent said swash plate drive, one end of the walls of each of said cylinders opening into a combustion space and said one end being located a substantial distance from the drive shaft, the opposite end of said walls being positioned adjacent said drive shaft, whereby the distance of said one end of the cylinder walls from the shaft is more than three times the distance between the opposite end and that shaft.

---

**4,129,103**

## MODULE UNIT

**Heinz Pichl, Upsala, Sweden, assignor to AB Volvo Penta, Gothenburg, Sweden**

**Filed Jun. 10, 1977, Ser. No. 805,272**

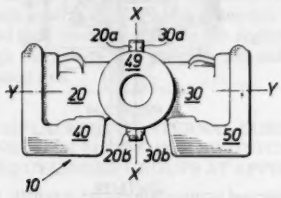
**Claims priority, application Sweden, Jun. 16, 1976, 7606826**

**Int. Cl.[2] F02B *75/18***

**U.S. Cl. 123—52 R** **14 Claims**

1. Device concerning cast cylinder blocks for liquid-cooled

two-stroke engines, characterised by the facility for the putting together of engines with various numbers of cylinders and of various types, the cylinder block comprises at least one unit module cast in one piece (**20, 30**) which comprises at least one cylinder part including cooling jacket (**27***a*) and transmission channel or channels (**29** *b-d*), and further one through exhaust gas flue (**57**) with both its end open and communicating within the unit module by means of at least one exhaust gas channel (**51**) with each cylinder (**27-29, 37-39**), one through cooling liquid duct (**52**) communicating within the unit module with each cooling jacket and with both its end open, and one through cooling liquid outlet (**53**) communicating at least with the cooling jacket in an outer cylinder (**27**), that the unit module shows plane frontal surfaces (**21, 31**) on its front and back sides in the axial direction, which are arranged for connection to an identical frontal surface in other corresponding unit modules or to a special end plate (**40 — 42, 50—52**) and in which the mentioned ducts and the cooling liquid outlet end in identical positions, so that with joining in the axial direction of many unit modules, through passages at least for exhaust gases and fed-in cooling liquid are produced, and that for the closure of the framework's first and last frontal surface two end plates exist which are so arranged that they complement each other in the meaning that when the one closes off one duct, the other produces a port for the same duct, preferably provided with a connection possibility (**43***b*) for a pipe or a hose, and vice-versa.



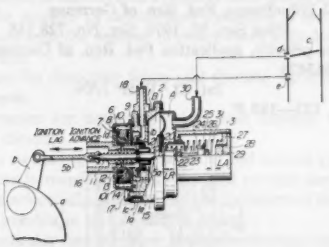

---

**4,129,104**

## IGNITION TIMING CONTROL DEVICE OF THE NEGATIVE PRESSURE ACTUATION TYPE

**Kazuhiko Kawakami, Katsuta, Japan, assignor to Hitachi, Ltd., Japan**

**Filed Aug. 17, 1976, Ser. No. 715,155**
**Claims priority, application Japan, Aug. 25, 1975, 50-102166**
**Int. Cl.² F02P** *5/06*
**U.S. Cl. 123—117 A** **5 Claims**



**1.** An ignition timing control device of the negative pressure actuation type comprising a diaphragm, two diaphragm cases holding said diaphragm therebetween to define a first diaphragm chamber and a second diaphragm chamber, a rod secured to the diaphragm at its central portion and extending at its forward end portion through the diaphragm on the first diaphragm chamber side, an ignition timing adjusting plate connected to the forward end of said rod, means for mounting an ignition signal generating means on said timing adjusting plate, a communication opening formed in a portion of one of said diaphragm cases through which the forward end portion of the rod extends, said communication opening being concentric with said rod and communicating with said first diaphragm chamber, an annular empty space formed as an extension of said communication opening and disposed concentric with the rod, a negative pressure introducing port disposed adjacent said empty space to communicate with a negative pressure source, an atmospheric pressure introducing port disposed adjacent said empty space to communicate with the atmosphere, an electromagnetically operated annular valve means arranged in said empty space and disposed concentrically with said rod, a seal member mounted between said valve means and said rod, and means for moving said valve means along the rod axially thereof so as to selectively communicate said negative pressure introducing port and said atmospheric pressure introducing port with said first diaphragm chamber.

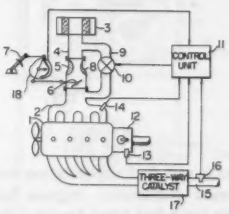
---

**4,129,105**

## AIR-TO-FUEL RATIO CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

**Osamu Ito, Toyota; Nobuhito Hobo, Inuyama; Yutaka Suzuki, Nishio; Itsushi Kawamoto, Chiryu; Takashi Naitou, Kariya; Makoto Shiozaki, Toyota, and Yoshimune Konishi, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan**

**Filed Jun. 22, 1977, Ser. No. 809,043**
**Claims priority, application Japan, Jun. 29, 1976, 51-77261**
**Int. Cl.² F02M** *7/00*
**U.S. Cl. 123—119 EC** **9 Claims**




**1.** An air-to-fuel ratio control system for internal combustion engines comprising:

a carburetor, positioned upstream of an engine of a vehicle and having a throttle valve therein, for supplying said engine with air-fuel mixture corresponding to the opening angle of said throttle valve;

a speed detector for generating a speed voltage indicative of the speed of said vehicle;

a pressure detector, provided in an intake passage connecting said carburetor with said engine, for generating a pressure voltage indicative of the pressure in said intake passage;

an oxygen detector, provided in the exhaust passage of said engine, for generating an oxygen voltage indicative of the air-to-fuel ratio of the mixture supplied to said engine;

a speed function generator, connected to be responsive to said speed voltage, for generating a speed function voltage the level of which is constant while the speed of said vehicle is lower than a lower preset speed and is higher than a higher preset speed;

a pressure function generator, connected to be responsive to said pressure voltage, for generating a pressure function voltage which varies in accordance with the pressure in said intake passage;

an oxygen function generator, connected to be responsive to said oxygen voltage, for generating an oxygen function voltage which varies in accordance with the air-to-fuel ratio of said mixture;

a selection circuit, adapted to select one of said pressure function voltage and said oxygen function voltage in response to the level of said speed function voltage, said selection circuit selecting said oxygen function voltage

while the speed of said vehicle is lower than said lower preset speed and said pressure function voltage while the speed of said vehicle is higher than said higher preset speed; and

an air addition passage, positioned to by-pass said carburetor and connected to be responsive to the function voltage selected by said selection circuit, for supplying said engine with air to thereby control the air-to-fuel ratio of said mixture in response to the speed of said vehicle, the amount of said air being controlled by said oxygen function voltage and said pressure function voltage while the speed of said vehicle is lower and higher than said respective lower preset speed and higher preset speed, respectively.

---

**4,129,106**

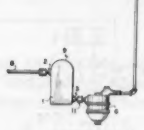
## VAPOR LOCK AND FUEL VAPORIZATION CONTROLS

**Donald L. Sellman, 407 S. 3rd St., Lincoln, Kans. 67455**

**Continuation-in-part of Ser. No. 152,786, Jun. 14, 1971, abandoned. This application Jul. 20, 1973, Ser. No. 381,346**

**Int. Cl.[2] F02M *59/00***

**U.S. Cl. 123—136** **1 Claim**



1. Vapor lock and fuel vaporization controls for gasoline powered internal combustion engines having a downdraft carburetor that has a fuel bowl having a float controlled inlet valve and a diaphragm pump type fuel supply system comprising in combination:

(a) two small one chamber closed auxiliary fuel vessels connected in the fuel conduit, through which all of the fuel flows, which have an inlet on a higher plane than the outlet, said vessels have no obstruction such as a check valve to prevent gravity flow of liquid fuel from the inlet to the outlet of said vessel, said vessels are shaped so as to have a gas cavity at top side;

(b) one small one chamber auxiliary fuel vessel is located on top of the carburetor fuel bowl and whose bottom side substantially form the top side of the fuel bowl, whose outlet is the inlet to the float controlled carburetor fuel bowl inlet valve which is located at the top side of said fuel bowl;

(c) the inlet of this small one chamber vessel is connected by the fuel conduit to the outlet of the fuel pump, there is no obstruction such as a check valve from the outlet of the fuel pump through the fuel conduit and said vessel to the flow of gas and or liquid fuel by suction to said vessel as liquid fuel flows by gravity out the outlet of said vessel;

(d) and the other small one chamber auxiliary fuel vessel is located adjacent and substantially above the fuel pump so as to hold a substantial supply of liquid fuel at a level above the fuel level in the fuel pump for gravity feed to the fuel pump to keep the fuel pump primed and if necessary to arrest perculation in said pump, the outlet of said vessel is connected to the inlet of the fuel pump by a short tubular member through which the liquid fuel is free to flow unhindered by any obstruction such as a check valve from said one chamber vessel to the inlet of the fuel pump.

**4,129,107**

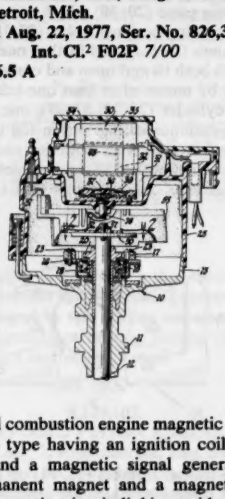
## MAGNETIC PICKUP TYPE IGNITION DISTRIBUTOR

**James A. Boyer, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.**

**Filed Aug. 22, 1977, Ser. No. 826,373**

**Int. Cl.[2] F02P *7/00***

**U.S. Cl. 123—146.5 A** **5 Claims**



1. In an internal combustion engine magnetic pickup ignition distributor of the type having an ignition coil located in the distributor cap and a magnetic signal generating assembly including a permanent magnet and a magnetically coupled pickup coil: a magnetic circuit linking said pickup coil for providing a path for magnetic flux developed by said permanent magnet and including rotatable means adapted to be driven by the crankshaft of an associated internal combustion engine which is operative when rotated to vary the intensity of the magnetic flux traversing said magnetic circuit whereby an alternating current wave form related to crankshaft position is induced in said pickup coil when said rotatable means is rotated; and pickup coil magnetic decoupling means for opposing the inducement of voltages in said pickup coil by magnetic flux produced by said ignition coil, said last named means comprising an annular ring member of an electrically conductive material providing a closed current flow path located in a position at which it is magnetically linked by those lines of magnetic flux produced by said ignition coil which also magnetically link said pickup coil for producing a magnetic flux in opposition to that produced by said ignition coil and is not substantially magnetically linked by the magnetic flux produced by said permanent magnet which traverses said magnetic circuit.

---

**4,129,108**

## PISTON FOR INTERNAL COMBUSTION ENGINES

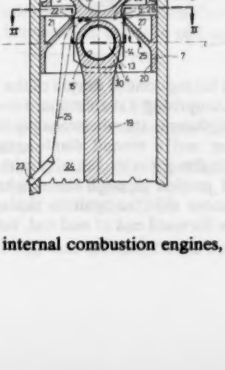
**Ludwig Elsbett, and Günter Elsbett, both of Industriestrasse 14, D8543 Hilpoltstein, Fed. Rep. of Germany**

**Filed Sep. 30, 1976, Ser. No. 728,165**

**Claims priority, application Fed. Rep. of Germany, Sep. 30, 1975, 2543478**

**Int. Cl.[2] F01P *1/04***

**U.S. Cl. 123—193 P** **10 Claims**



1. A piston for internal combustion engines, especially Die-

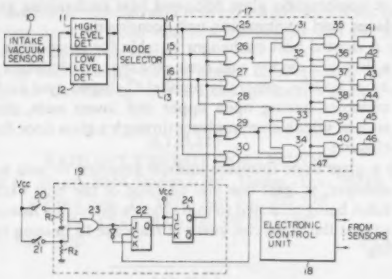
sel engines, which includes in combination: a piston head portion for receiving and supporting piston rings, a gudgeon pin, a mantle connected to said head portion and forming a foot portion with bearing means supporting said gudgeon pin, slide shoe means pivotally supported by said gudgeon pin and provided with at least one guiding surface directed from said slide shoe means inwardly and at an incline with regard to the piston axis and in the direction toward said mantle for directing a coolant and lubricant sprayed into said piston to flow both against said foot portion of said piston and also around the bearing means for said gudgeon pin and against the latter, each of said guiding surfaces having a free edge nearly extend to said bearing means for said gudgeon pin, each of said guiding surfaces being formed by a mantle surface section of said slide shoe means, each guiding surface being connected to an inner wall side of said slide shoe means within the region of a plane passing through the axis of said gudgeon pin and at a right angle to the piston axis.

## 4,129,109

## VARIABLE DISPLACEMENT INTERNAL COMBUSTION ENGINE WITH MEANS FOR SWITCHING DEACTIVATED CYLINDER GROUPS AT APPROPRIATE TIMING

**Junichiro Matsumoto, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan**

**Filed Aug. 11, 1977, Ser. No. 823,746**
**Claims priority, application Japan, Aug. 12, 1976, 51-95383**
**Int. Cl.[2] F02B *3/00*; F02D *13/06***
**U.S. Cl. 123—198 F** **10 Claims**




1. An internal combustion engine having a throttle valve and a first and a second group of cylinders adapted to be activated and deactivated in response to varying loads of the engine, comprising:

means responsive to said varying engine loads to determine the number of deactivated cylinders such that at maximum load the number of deactivated cylinders is zero and at minimum load the number of deactivated cylinders is at a maximum;

first means for detecting when said throttle valve is nearly wide open;

second means for detecting when said throttle valve is nearly closed;

means for switching between said first and second groups of cylinders in response to said first and second means; and

means for selectively deactivating the cylinders of the determined number in said switched group.

6. An electronic fuel injection system including a source of injection signals for use in an internal combustion engine having a throttle valve and a first and a second group of cylinders each being provided with a fuel injector adapted to be applied with said injection signal in response to varying loads of said engine, comprising:

means responsive to said varying engine loads to determine the number of deactivated cylinders such that at maximum load the number of deactivated cylinders is zero and at minimum load the number of deactivated cylinders is one half of the total number of said cylinders;

first means for detecting when said throttle valve is nearly wide open;

second means for detecting when said throttle valve is nearly closed;

means for switching between said first and second groups of cylinders in response to said first and second means; and

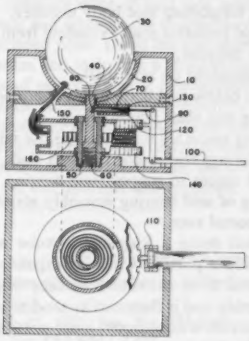
logic gate means selectively inhibiting the application of said signals to injectors associated with the cylinders of the selected group, said inhibited injectors being equal in number to said determined number of deactivated cylinders.

## 4,129,110

## DEVICE FOR LAUNCHING AND RETRIEVING A SPHERICAL BALL

**Ronald Kubrak, 7 Beechwood Ct., Hazlet, N.J. 07730**

**Filed Jan. 6, 1977, Ser. No. 757,443**
**Int. Cl.[2] F41B *7/00***
**U.S. Cl. 124—16** **1 Claim**



1. A device for launching a spherical ball to enable the ball to be hit by a bat and then retrieved after being hit, comprising;

a spherical ball;

a housing with an open-topped hemispherical recess in its top into which the ball may be placed;

foot-operated ejector means for propelling the ball upwardly out of the recess when the ejector means is actuated, the means cooperating with the ball and recess in a manner that once the ball has been replaced in the recess after the means has been operated, the means will be reset for a subsequent operation, said ejector means including a spring-loaded plunger extending upwardly into said recess;

an elongated flexible cable attached at one end to the ball; and

a spring-loaded retractor means located in the housing and attached to the end of the cable remote from the ball to retract the ball back into the recess after the ball has been ejected out of the recess and hit by a bat, said retractor means comprising a reel rotatably mounted in the housing, said cable being attached at its other end to the reel and a coiled spring within the reel affixed at one end to a fixed point in the housing within the reel and affixed at its other end to the inside of said reel in a manner whereby as the cable unwinds from the reel the spring winds up and when the cable is unwound the wound spring rotates the reel to rewind said cable by unwinding.

**4,129,111**

## BEARING ASSEMBLY FOR BARBECUES

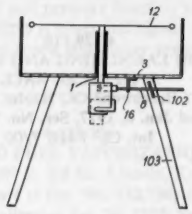
**Ritva M. Lehtovaara, 20 S. Close Green, Merstham, Surrey, England**

**Filed Jul. 15, 1976, Ser. No. 705,420**

**Claims priority, application United Kingdom, Jul. 18, 1975, 30199/75**

**Int. Cl.[2] A47J 37/07; F24B 3/00**

**U.S. Cl. 126—25 AA** **6 Claims**




1. A barbecue comprising

a body member arranged to contain a bed of burning fuel,

a stand supporting said body member,

a vertical rotatable shaft extending from below to above said body member,

a grid mounted on said shaft,

a motor below said body member connected to said shaft to rotate said shaft continuously,

a bearing assembly suspended below said body member and supporting said motor and said shaft,

support means to support said bearing assembly and allow tilting of said bearing assembly about two perpendicular horizontal axes,

said shaft being a longitudinal tube which is crimped to provide a portion which is expanded in one transverse dimension to provide a surface engaging said bearing assembly and is flattened in another transverse dimension to provide a constricted inner portion of said tube,

and a flexible coupling which is a wire loop having an expanding spring portion inside said tube above said constricted inner portion so that said constricted portion supports said loop and said loop is mounted on the lower end of said shaft to engage a driving shaft of said motor.

**4,129,112**

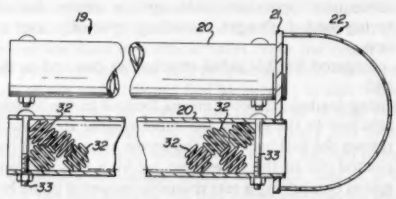
## HEAT EXCHANGE APPARATUS

**Alan Glasser; Jens P. Schwarz, both of 101 Tenby Rd., Havertown, Pa. 19083, and Lance A. Glasser, Mattapan, Mass., assignors to Alan Glasser and Jens P. Schwarz, both of Havertown, Pa.**

**Filed Aug. 9, 1976, Ser. No. 712,987**

**Int. Cl.[2] F24B 7/00**

**U.S. Cl. 126—121** **10 Claims**




10. A subcombination for use in heat exchange apparatus for improving the efficiency of a fireplace comprising a conduit of good heat conductive metal, a plurality of heat transfer elements in said conduit, said elements being of good heat conductive metal, said elements being randomly disposed in contact with each other and the inner peripheral surface of said conduit for providing turbulence to air flow through the conduit, said elements being of uniform size and being hollow, said elements having a plurality of flow passages communicating with their hollow interior, said elements being generally spherical and formed of wire with adjacent turns being spaced from one another by a distance less than the diameter of the wire to prevent the spheres from slipping inside one another, the diameter of the spherical elements being less than the diameter of said conduit.

**4,129,113**

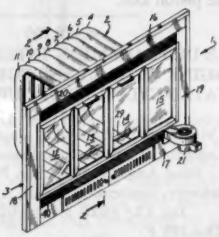
## COMBINATION GLASS DOOR AND HEAT-EXCHANGING GRATE FOR FIREPLACES

**Theodore R. Bergstrom, St. Paul, Minn., assignor to Thermograte, Inc., St. Paul, Minn.**

**Filed Mar. 30, 1977, Ser. No. 782,623**

**Int. Cl.[2] F24B 7/00**

**U.S. Cl. 126—121** **13 Claims**



1. A combination glass door and heat exchanging grate for fireplaces, said combination unit comprising:

(a) A ducted heat exchanger suitable for positioning within a fireplace cavity, said heat exchanger including a plurality of hollow, generally parallel C-shaped heat exchanger members having open upper and lower ends, the open ends of which communicate through a glass door fireplace closure;

(b) a glass door fireplace closure attached to said heat exchanger, at least one end of some of the heat exchanger tubes being attached to said closure through a floating seal so that the tubes can yawn in response to heating or cooling.

**4,129,114**

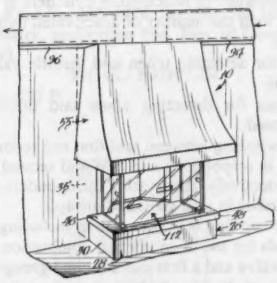
## FIREPLACE-FURNACE SYSTEM

**William H. Hiser, Bartonville, Ill., assignor to Lighthouse Fireplaces, Inc., Bartonville, Ill.**

**Filed Oct. 4, 1976, Ser. No. 729,002**

**Int. Cl.[2] F24B 7/04**

**U.S. Cl. 126—122** **20 Claims**




1. A self-contained modular fireplace and circulating air unit for installation in a building living area comprising:

(a) a plurality of modules defining a combustion system and an air circulating system functionally isolated from said combustion system and including:

(a-1) a sheet metal base member adapted to be supported by a floor in the building living area;

(a-2) a pair of spaced apart vertically extending sheet

metal ducts supported by said base member, each of said ducts defining an air column, said air columns rising from the rear corner portions of said base member;

(a-3) a mantel supported between said air columns and extending forwardly therefrom, said mantel being spaced above the upper surface of said base member to define a fire box area therebetween and including an aperture defining an exhaust opening for said fire box;

(a-4) a fire back module disposed between and affixed to said air columns and extending between said support base and said mantel;

(a-5) an external generally planar back member extending between said air columns and spaced rearwardly of said fire back module to define an insulating air space therebetween; and

(a-6) heat exchanger means disposed above and in communication with said exhaust opening to intercept exhaust products of combustion from said fire box for transferring heat from said combustion exhaust to said heat exchanger;

(b) said combustion system including said fire box and said heat exchanger means;

(c) said circulating system including at least a part of said air columns defining circulating air ducts with portions of said circulating air ducts located adjacent to, on either side of, and in communication with said heat exchanger means and extending upwardly from said location adjacent said heat exchanger means for connection to air distribution ducting forming a part of the building in which said unit is disposed; and

(d) blower means for circulating air through said circulating air ducts and through said heat exchanger means for transferring heat between said heat exchanger and the air in said circulating air ducts;

whereby said building may be heated by air passing through said air circulating system through said building duct work.

---

**4,129,115**

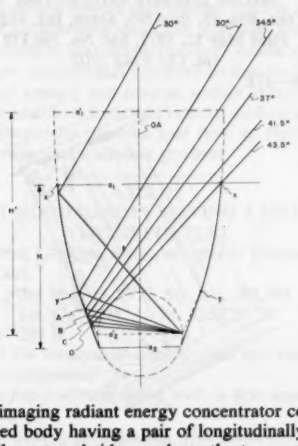
## RADIANT ENERGY COLLECTOR

**William G. Wyatt, 8366 Garland Rd., Dallas, Tex. 75218**

**Filed Sep. 27, 1976, Ser. No. 727,125**

**Int. Cl.² F24J *3/02*; G02B *5/10***

**U.S. Cl. 126—270** **8 Claims**




1. A non-imaging radiant energy concentrator comprising a trough-shaped body having a pair of longitudinally extending symmetrically opposed side members, the top opposed edges of said side members separated by a transverse distance and defining an entrance aperture and the bottom opposing edges separated by a transverse distance and defining an exit aperture, the internal surface of said side members having a concave portion adjacent the top edge, the concave portion being that portion of a parabola lying between points X and Y on a parabola defined by the walls of an imaginary concentrator comprising a trough-shaped body having a longitudinally extending entrance aperture with first and second opposing edges separated by a transverse distance $a_1'$, a longitudinally extending exit aperture separated by a transverse distance $a_2'$ and a pair of symmetrical concave walls interconnecting laterally corresponding edges of said apertures, a field of acceptance for radiant energy, an angular acceptance for radiant energy within said field of acceptance and determinable at said entrance aperture of said imaginary concentrator, and an optical axis determinable by reference to distances separating entrance and exit aperture opposing edges of said imaginary concentrator, wherein the ratio of distances $a_2'$ to $a_1'$ is no less than the sine of said angular acceptance, the profile curve of each of said side walls of said imaginary concentrator is a parabola having as its parabolic focus the opposing edge of said exit aperture of said imaginary concentrator and as its parabolic axis a line forming an angle with said optical axis of the imaginary concentrator body numerically equal to said angular acceptance, and the field of acceptance of the imaginary concentrator body, when represented in terms of optical direction cosines, is an elipse of semi-minor axis equal to the sine of said angular acceptance and semi-major axis substantially equal to one, wherein Y is a point on said parabola approximately at which a straight line tangent to a circle having the exit aperture of said imaginary concentrator as its diameter is also tangent to said parabola and X is a point on said parabola between point Y and the entrance aperture edge of said side walls of said imaginary concentrator and wherein the profile curve of each side wall member between point Y and the exit aperture edge is a curve lying between and including a straight line parallel with the optical axis of said imaginary concentrator but not including a continuation of said parabola; whereby radiation entering the concentrator at angles greater than the angle of acceptance of said imaginary concentrator and striking the side wall of the concentrator between point Y and the exit aperture may be reflected to the exit aperture and captured.

---

**4,129,116**

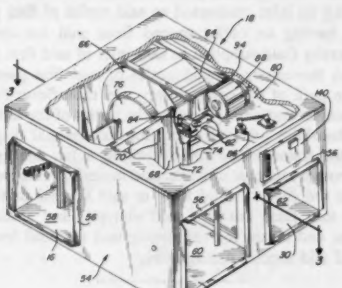
## SOLAR AIR FLOW CONTROLLER AND SYSTEM

**Thomas B. Kent, Boulder, Colo., assignor to Solar Control Corporation, Boulder, Colo.**

**Filed Oct. 22, 1976, Ser. No. 735,096**

**Int. Cl.² F24J *3/02***

**U.S. Cl. 126—270** **11 Claims**




1. A unitary flow controller for use in a solar heating system for heating air space within a building comprising:

a blower having an inlet port and an outlet port;

air confining means connected to said inlet and outlet ports of the blower;

said air confining means being in the form of an enclosure for use within a building, said enclosure having walls and provided with first, second, and third air flow ports in said walls for flow communication with first, second, and third air flow ducts;

a plurality of flow control members in the general form of baffles movably connected to the air confining means to control and direct the flow of air through the ports and the blower;

and selectively operable means to adjust the flow control

members to three different relative positions to produce three different flow paths through the controller;

a first relative position defining a flow path from the second air flow port to the inlet port of the blower and from the outlet port of the blower to the third air flow port;

a second relative position defining a flow path from the first air flow port to the inlet port of the blower and from the outlet port of the blower to the third air flow port;

and a third relative position defining a flow path from the first air flow port to the inlet port of the blower and from the outlet port of the blower to the second air flow port.

---

**4,129,117**

## SOLAR ENERGY COLLECTOR

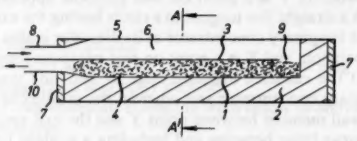
**Lawrence Harvey, Coldharbour Nr. Dorking, England, assignor to The British Petroleum Company Limited, London, England**

**Filed Apr. 21, 1976, Ser. No. 678,958**

**Claims priority, application United Kingdom, Apr. 21, 1975, 16349/75**

**Int. Cl.² F24J *3/02***

**U.S. Cl. 126—271** **17 Claims**




1. A solar energy collector comprising means including a pair of solar energy transparent walls in spaced, side-by-side relation and defining between said walls a first fluid passageway for the passage of fluid therebetween and in contact with said walls, said passageway having an inlet and an outlet spaced from said inlet and being free of solar energy obstructing material so that in the absence of said fluid, solar energy passing through one of said walls is permitted to traverse said passageway and pass through the other of said walls; means including a third wall in spaced, and side-by-side relation with said other of said walls and defining, between said third wall and said other wall, a second fluid passageway for the passage of said fluid which is disposed in the path of solar energy which passes through said pair of walls, said second passageway having an inlet connected to said outlet of first passageway and having an outlet spaced from said last-mentioned inlet, whereby fluid supplied to said inlet of said first passageway flows therealong to said outlet of said first passageway and in the path of the solar energy and then flows from said inlet of said second passageway to the outlet of the latter; solar energy absorbent particulate or fibrous material disposed in said second passageway for absorbing solar energy which passes through said pair of walls, said material being permeable by and in the path of fluid flow in said second passageway, whereby said fluid contacts said material and absorbs heat therefrom; and means for restraining said material from flowing out of said second passageway.

---

**4,129,118**

## METHOD AND APPARATUS FOR PROVIDING DIFFERENTIAL TEMPERATURE THERMOSTAT CONTROL FOR SOLAR HOT WATER SYSTEMS

**Kerry O. Banke, La Mesa, Calif., assignor to Samuel G. Dawson, El Cajon, Calif.**

**Filed Jul. 23, 1976, Ser. No. 707,943**

**Int. Cl.² F24J *3/02***

**U.S. Cl. 126—271** **10 Claims**

1. A differential temperature control for controlling the moving of water between a solar collector and a hot water storage comprising:

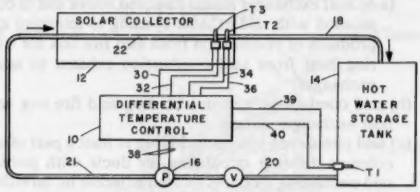
first means for detecting the temperature of the water in the hot water storage and providing a first electrical condition proportional to the storage water temperature,

second means for detecting the temperature of the water leaving the solar collector providing a second electrical condition proportional to the solar water temperature,

first differential means for comparing said first and second electrical conditions and providing an output signal when said solar water temperature exceeds said storage water temperature a first given amount,

reference means for providing at least one reference electrical signal,

second differential means for comparing said output signal and said reference signal and providing a first control signal when the difference between said output signal and said reference signal exceeds a given magnitude and a second control signal when the difference between said output signal and said reference signal is less than a given magnitude,




switch circuit means for being closed in response to one of said control signals and being opened in response to the other of said control signals,

said reference means including means for providing a first reference electrical signal in response to said switch being open and for providing a second reference electrical signal in response to said switch means being closed,

and said second differential means comparing said output signal with said first reference signal and providing a control signal when the difference between said output signal and said first reference signal exceeds a given magnitude, and comparing said output signal with said second reference signal and providing a control signal when the difference between said output signal and said reference signal exceeds a given magnitude.

---

**4,129,119**

## SOLAR ENERGY COLLECTOR

**James H. Yoke, Rte. 15, Box 395, Acton, Ind. 46259**

**Filed May 12, 1977, Ser. No. 796,179**

**Int. Cl.² F24J *3/02***

**U.S. Cl. 126—271** **9 Claims**

1. A solar energy collector adapted for use with a solar energy system comprising:

a lower header defining an open interior;

a pipe connected to said lower header, said pipe defining a passageway communicating with the interior of said lower header;

an upper header connected with said pipe, said upper header defining an open interior communicating with the passageway of said pipe;

means for supporting said upper header above said lower header; and

a unitary reflector mounted to and supported by said pipe, said reflector oriented to direct rays impinging thereupon at said pipe, said reflector comprising a plurality of rigid panels defining apertures within which said pipe is received, said reflector including two end panels and at least one intermediate panel located therebetween, the panels having formed edges surrounding and displaced from a portion of said pipe, said reflector further comprising a reflective material mounted to the formed edges.

---

**4,129,120**

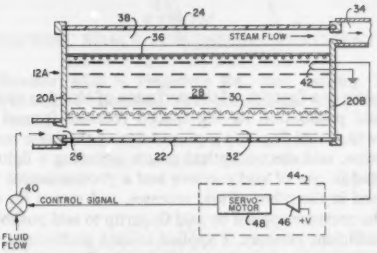
## HEATING AND VENTILATION SYSTEM

**Norman B. Saunders, 15 Ellis Rd., Weston, Mass. 02193**

**Continuation-in-part of Ser. No. 607,568, Aug. 25, 1975, abandoned, which is a division of Ser. No. 529,235, Dec. 3, 1974, Pat. No. 3,952,947. This application Aug. 5, 1977, Ser. No. 822,346**

**Int. Cl.[2] F24J** *3/02*

**U.S. Cl. 126—271** **13 Claims**




1. A heating system comprising:

a container having an internal surface absorptive of solar heat radiation and a transmissive surface transmissive to said solar radiation and disposed so as to transmit solar heat radiation to said internal surface;

means for introducing heat absorbing fluid into said container at a controllable flow rate from one side of said internal surface toward said internal surface; and

means for withdrawing said fluid from said tank from the opposite side of said internal surface;; means adjusting the fluid flow rate into said container so that the flow rate of said fluid toward said internal surface is regulated such that the heat flow from said internal surface in the direction substantially opposite said flow of fluid provide a predetermined temperature gradient.

---

**4,129,121**

## EXHAUST HOOD CANOPY HAVING A MULTI SLOT VENTURI OUTLET

**John O. Dorius, Glendale, Calif., assignor to Elsters, Inc., Hollywood, Calif.**

**Filed May 23, 1977, Ser. No. 799,389**

**Int. Cl.[2] F21C** *15/08;* **F23J** *11/00*

**U.S. Cl. 126—299 D** **3 Claims**

1. A hood for removal of smoke, gases and vapors from a heat surface comprising:

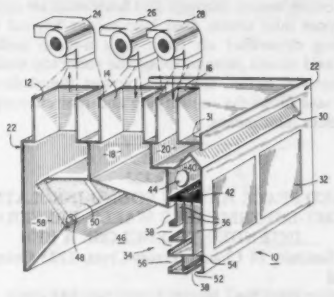
a first plenum communicating with a first source of tempered air;

an exhaust duct communicating with a sink of air;

a housing communicating with said first and second plenums and said exhaust duct, said housing forming a hood cavity, an exhaust chamber, and a first chamber and a second chamber, said first plenum being coupled to said first chamber, said second plenum being coupled to said second chamber;

an outlet having a plurality of slots communicating with one side of said hood cavity and a third chamber divided into a plurality of channels and a mixing subchamber, said first chamber communicating with said mixing subchamber through a plurality of sharp edged apertures, said plurality of channels communicating with said mixing subchamber through a pervious plate;

an inlet having at least one filter disposed thereacross at an angle wherein the lower portion of said filter is closer to said plurality of slots of said outlet than the upper portion of said filter, said hood cavity communicating with said exhaust duct through said inlets; and



a cooking line ventilation slot disposed in said housing and directing air flowing therethrough to regions below said ventilation slot, said ventilation slot communicating with said second chamber,

whereby a hood is devised which provides a substantially streamline, high velocity and uniform pattern of air flow across said hood cavity and a flow of comfort conditioned air along a cooking line with requiring a large volume of air flow.

---

**4,129,122**

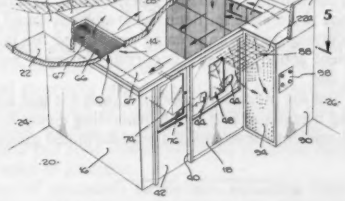
## PATIENT ISOLATION ROOM WITH LAMINAR FLOW FEATURE

**James A. Dout, Fullerton, and Robert E. Foreman, Santa Ana, Calif., assignors to Sterilaire Medical, Inc., Santa Ana, Calif.**

**Filed Apr. 27, 1977, Ser. No. 791,419**

**Int. Cl.[2] A61B** *19/00*

**U.S. Cl. 128—1 R** **9 Claims**



1. A patient isolation room having side, top and bottom wall means surrounding a relatively smaller patient locus adapted to be installed in a normal hospital room, one of said side walls defining a room entry doorway, said top wall having a horizontal continued extent projecting beyond said doorway-defining side wall, a horizontal air outlet formed in said top wall extent adjacent said sidewall and spaced from said doorway, further wall means between said patient isolation room top wall and the hospital room ceiling defining a closed passageway therebetween continuous air flow loop means isolating said locus from airborne contaminants beyond the locus, said loop means including an in-room inlet means and an in-room outlet means relatively sized and oppositely arranged in re-

spective walls of said room such that said locus is encompassed on every side with a purified horizontal unidirectional, laminar air stream of uniform velocity throughout its cross-section, said in-room outlet means and said horizontal air outlet communicating with said closed passageway, and means including high efficiency particulate air filters for repurifying air and a blower alongside said doorway defining sidewall adjacent and below said horizontal air outlet thereby, being spaced from said doorway, said blower being in air drawing communication with said horizontal air outlet for recirculating air from said in-room outlet means, through said horizontal air outlet, and to said in-room inlet means, said loop means beyond said room conducting depurified air from said in-room outlet means, through said closed passage above the room top wall, through said horizontal outlet, into said blower therebelow, to and through said filters for repurifying and recirculating and into said in-room inlet means.

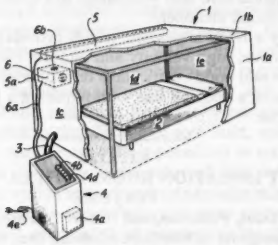
---

**4,129,123**

## DEFINED SPACE HAVING SOUND-INSULATED AND LIGHT-IMPERMEABLE WALLS, PREFERABLY INTENDED TO ENCLOSE A BED

**Emil F. Smidak, 14 Chemin Hauts-Crets, 1223 Cologny, Switzerland**

**Filed Sep. 30, 1977, Ser. No. 838,406**
**Claims priority, application Sweden, Oct. 1, 1976, 7610896**
**Int. Cl.[2] F24F 9/00; A61B 19/00**
**U.S. Cl. 128—1 R** **8 Claims**




1. A defined space having sound-insulated and light-impermeable wall members comprising:
- air conditioning means connected to said space for controlling the atmospheric conditions therein;
- means for generating sound in said space, the intensity of the sound being variable over a predetermined duration of time;
- means for controlling the intensity of the sound generated in said space to simulate the decrease in ambient sound intensity occurring during an evening period and the increase in ambient sound intensity occurring during a morning period; and
- a central unit for producing control signals for said air-conditioning means and said sound generating means to simulate the ambient conditions of a predetermined geographic site.

---

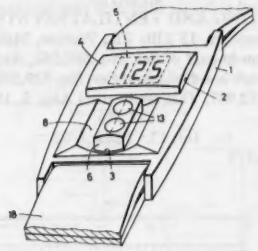
**4,129,124**

## PULSE-RATE INDICATOR

**René A. Thalmann, Starrkirch, Switzerland, assignor to Elektro-Apparatebau Olten A.G., Olten, Switzerland**

**Filed Feb. 10, 1977, Ser. No. 767,623**
**Claims priority, application Switzerland, Mar. 23, 1976, 3619/76**
**Int. Cl.[2] A61B 5/02**
**U.S. Cl. 128—2.05 T** **2 Claims**

1. A pulse rate indicator of the type having a current supply circuit, means for converting pulse beats into electric measuring pulses, and a pushbutton for operating said indicator, the improvement comprising a casing to which a strap is attached for mounting the casing on the wrist of the wearer, said pushbutton being mounted on said casing, said current supply circuit including a switch that is located in said casing and that is operable in response to depression of said pushbutton to close the circuit thereto, a measuring circuit located in said casing for ascertaining the pulse rate per minute based on a predetermined number of said electric measuring pulses, digital indicating means located in said casing and responsive to said measuring circuit for visually displaying the pulse rate per minute as ascertained by said measuring circuit, electro-optical means located in said pushbutton and being responsive to contact of a human fingertip therewith for generating said electric measuring pulses as a function of the perfusion of blood in said fingertip, said pushbutton having spaced recesses formed therein over which said fingertip is placed during the pulse measuring operation, said electro-optical means including a light source disposed in one of said recesses and a photosensitive element disposed in the other of said recesses, and means for controlling the pressure applied by said fingertip to said pushbutton so that sufficient pressure is applied to said pushbutton to close said switch and so that the pressure of the fingertip is limited in order to obtain a proper measurement of the perfusion of blood therein.



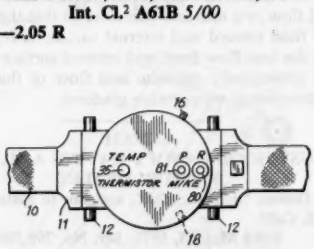

---

**4,129,125**

## PATIENT MONITORING SYSTEM

**Robert W. Lester, Manhasset, and Robert Hotto, New York, both of N.Y., assignors to Camin Research Corp., New York, N.Y.**

**Filed Dec. 27, 1976, Ser. No. 756,026**
**Int. Cl.[2] A61B 5/00**
**U.S. Cl. 128—2.05 R** **7 Claims**




1. A monitoring system for measuring the vital signs such as temperature, respiration and heart beat of a patient comprising:
- a housing designed for body contact with the skin of the patient;
- means for securing said housing on a patient's body;
- clock timing means disposed in said housing for generating time based signals;
- logic means connected to said clock timing means and being responsive to said time based signals for selecting the proper combinations of said time based signals;
- a temperature sensor coupled to sid logic means and disposed on said housing for measuring the body temperature of the human subject;
- microphone means coupled to said logic means and mounted

in said housing for detecting respiratory and cardiac sounds;

solid state memory means having coded information temperature, respiration and cardiac signals and coupled to said logic means for sequencing said logic means to take a plurality of temperature, cardiac and respiratory readings at a preset real time and to compare said measured readings with said coded information signals;

data storage means for sequentially recording each of the stabilized temperature, respiration and cardiac readings that were measured; and

display means on said housing responsive to said solid state memory means and said logic means for indicating the magnitude of the temperature, respiration and heart beat of the patient.

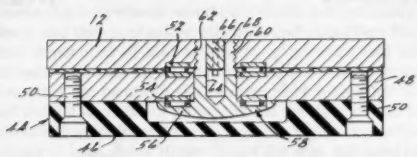
---

**4,129,126**

## ORTHOPEDIC BRACE FOR USE IN TREATMENT OF LEGG PERTHES DISEASE

**David Shneider, 4528 S. Hagadorn Rd., East Lansing, Mich. 48823, and Lee D. Boerman, 1441 E. Michigan Ave., Lansing, Mich. 45912**

**Filed Jul. 20, 1977, Ser. No. 817,141**
**Int. Cl.² A61F 3/00**
**U.S. Cl. 128—80 A** **10 Claims**



1. An orthopedic brace comprising, in combination, a pair of angularly disposed support plates, a rigid cross bar extending transversely between said support plates, a rotatable pad rotatably secured to the lower surface of each of said support plates, and fixed pad means secured to the lower surface of each of said support plates in spaced relationship with respect to said rotatable pad.

---

**4,129,127**

## METHOD OF MAKING A SURGICAL CAST

**Francis D. Ellison, 5005 E. 10th St., Indianapolis, Ind. 46201**

**Filed Mar. 24, 1977, Ser. No. 780,709**
**Int. Cl.² A61F 5/04**
**U.S. Cl. 128—89 R** **7 Claims**

1. A method of making an immobilizing cast comprising the steps of:

securing on the body portion to be encased, first and second barriers in circularly spaced relationship;

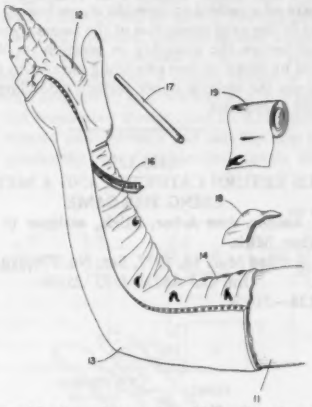
applying to a first sector of said body portion between faces of said barriers, a flexible dressing material;

forming detents in said dressing material at said barriers to provide detented edges on said material;

rigidizing said dressing material to form a rigid first shell;

removing said barriers while retaining said first shell in place on said first sector;

applying to a second sector of said body portion between said edges a flexible dressing material;



forming at said edges detents in said flexible dressing material on said second sector mating with said detents in said first shell; and

rigidizing said dressing material to form a rigid second shell.

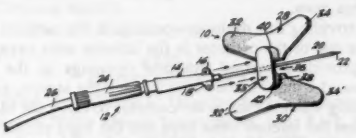
---

**4,129,128**

## SECURING DEVICE FOR CATHETER PLACEMENT ASSEMBLY

**Richard H. McFarlane, 506 Tyler Rd., St. Charles, Ill. 60174**

**Filed Feb. 23, 1977, Ser. No. 771,187**
**Int. Cl.² A61M 5/00**
**U.S. Cl. 128—133** **5 Claims**



1. A securing device for a catheter placement assembly wherein said assembly defines a flow through passageway and includes:

a flexible catheter having a pointed distal end which in use extends through a skin puncture site into the vein of a patient after a rigid needle has been withdrawn from the assembly and wherein the catheter includes a proximal end exteriorly of the site adjacent the puncture;

a catheter body having a proximal supply end including a fitting adapted to be connected to a supply tube and a distal end zone connected to the proximal catheter end at a zone of juncture;

a pair of oppositely facing ears extending from the body adjacent the zone of juncture, each of said ears and said zone of juncture being of a common predetermined size and shape;

said securing device comprising a molded body of relatively thin, plastic material of inverted cup-shaped form having a top surface and a depending skirt with a terminal edge spaced from the top surface, said body defining a socket bounded by a proximal and distal portion, each with a cut-out and spaced side portions connecting the proximal and distal portion, and said socket being sized and configured to nestle in mating relation over and above the ears with the distal end zone of the body extending axially through the cut-outs,

said securing device comprising wings extending laterally

from the terminal edge of each of said side skirt portion and each of said wings including:

a proximal and distally-extending diverging portion having a smooth upper surface, said wing being adapted to overlay the skin of a patient to provide an anchoring surface outboard of the axial centerline of the assembly and puncture site to secure the assembly in position on the skin of a patient by strips of tape extending parallel to the assembly and over the smooth upper surface extending axially and distally therefrom.

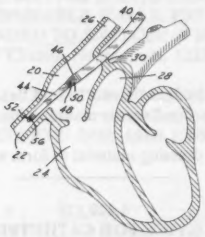
---

**4,129,129**

## VENOUS RETURN CATHETER AND A METHOD OF USING THE SAME

**Bruce A. Amrine, Ann Arbor, Mich., assignor to Sarns, Inc., Ann Arbor, Mich.**

**Filed Mar. 18, 1977, Ser. No. 779,018**
**Int. Cl.[2] A61M *1/03, 25/00***
**U.S. Cl. 128—214 R** **7 Claims**




1. In a method of by-passing blood flow from the heart during open heart surgery, those steps which comprise:

(a) introducing a venous return catheter into the right atrium of the heart and extending the catheter into the inferior vena cava,

(b) providing first drainage openings in the catheter adjacent the end of the catheter in the inferior vena cava,

(c) providing second drainage openings in the catheter spaced from the end to lie in the right atrium, and

utilizing a single tube in the catheter to carry the blood flow from the inferior vena cava and the right atrium to extracorporeal life support equipment.

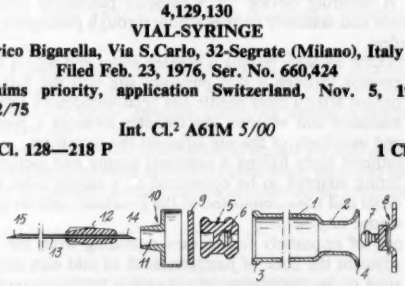
---

**4,129,130**

## VIAL-SYRINGE

**Federico Bigarella, Via S.Carlo, 32-Segrate (Milano), Italy**

**Filed Feb. 23, 1976, Ser. No. 660,424**
**Claims priority, application Switzerland, Nov. 5, 1975, 14312/75**
**Int. Cl.[2] A61M *5/00***
**U.S. Cl. 128—218 P** **1 Claim**




1. A syringe, comprising an elongated container having a longitudinal axis, a wall bounding the interior of said container, a leading open end of a predetermined major diameter and a substantially cylindrical trailing open end of a predetermined minor diameter smaller than the major diameter, said trailing end extending substantially parallel to the longitudinal axis of said container and provided at its open end with a rim projecting outwardly and substantially normal to said longitudinal axis of said container, and having an outside diameter substantially equal to the major diameter of the leading end, thereby bounding a circumferential recess on an outside surface of the wall for receiving a user's fingers therein, said recess having a front end face directed towards said leading open end of the predetermined major diameter and rear end face directed towards said rim of the outside diameter substantially equal to the major diameter to thereby eliminate the user's fingers slipping along and from said barrel container in either directions; an elastomeric piston axially slidable in said container and having an outside diameter equal substantially to said major diameter, said piston being formed with a recess open axially toward said other end whereby said piston can be introduced into said container through said one end; an elongated plunger extending axially into said container through said narrow neck and having an end formation snugly engaged in said recess of said piston; a pierceable membrane sealingly covering said one end; a cap force fitted over said membrane at said one end and securing said membrane tightly in place thereon, said cap forming seat open axially away from said container; a hollow needle having a pair of oppositely directed pointed fingers; and a plug surrounding said needle intermediate said tips thereof and snugly receivable in said seat with one of said tips engaging through said membrane into said body portion.

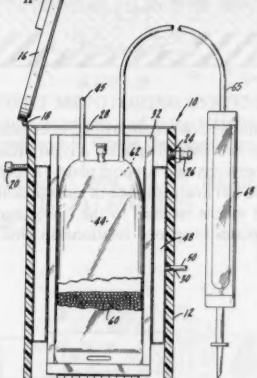
---

**4,129,131**

## METHOD AND APPARATUS FOR DEFIBRINATION OF BLOOD

**Henry Naftulin, 8341 N. Kenton Ave., Skokie, Ill. 60076**

**Filed Oct. 26, 1976, Ser. No. 735,173**
**Int. Cl.[2] A61M *1/03***
**U.S. Cl. 128—276** **10 Claims**




1. A method of collecting and defibrinating blood in a flexible container, comprising the steps of:

(a) adding and confining a predetermined quantity of gas and a plurality of small formed elements within the flexible container;

(b) positioning the flexible container within a vacuum chamber;

(c) creating a vacuum within the chamber which in turn causes the confined gas within the flexible container to expand and create a gas pocket therein;

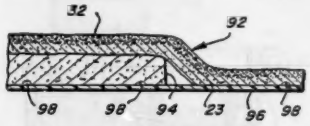
(d) collecting the blood into the flexible container such that the gas pocket and collected blood substantially fill and rigidize the flexible container; and

(e) agitating the flexible container so as to cause the formed elements to move rapidly through the blood and the gas pocket and whip out the fibrin.

## 4,129,132
## FIBROUS MATERIAL AND METHOD OF MAKING THE SAME

George A. M. Butterworth, Western Springs; Robert T. Elias, Downers Grove, and Wayne D. Miller, Oak Lawn, all of Ill., assignors to Johnson & Johnson, New Brunswick, N.J.

Division of Ser. No. 734,208, Oct. 20, 1976, Pat. No. 4,081,582. This application Oct. 3, 1977, Ser. No. 838,611
Int. Cl.[2] A61F *13/16*
U.S. Cl. 128—287 17 Claims




1. In a diaper structure comprising a facing layer, an absorbent batt and an impervious backing layer in which said facing layer and said backing sheet are outermost layers and said batt is positioned between said facing layer and said backing sheet, the improvement wherein said facing layer comprises a high loft, low density, nonwoven fibrous material of good stability and mechanical integrity, excellent resistance to delamination, and good hand and softness, which comprises a first layer of irregularly arranged, intersecting, overlapping, mechanically interengaged, loosely assembled fibers defining interstices therebetween, said fibers including fibers other than thermoplastic synthetic wood pulp fibers, and a second layer of similarly disposed fibers in firm engagement with said first layer at an interface therebetween, said second layer including, at least thermoplastic synthetic wood pulp fibers and optionally, other fibers, said thermoplastic synthetic wood pulp fibers located at least in portions of said second layer adjacent said interface between said two layers, thermoplastic synthetic wood pulp fibers that are mechanically interengaged with other fibers in said second layer being present in the portions of said layer at said interface between the two layers in a quantity sufficient to occupy at least about 10 percent of the area occupied by fiber segments contained in said second layer at said interface, fibers of at least one of said two layers extending across the interface between the two layers with free end portions of said fibers positioned within interstices between fibers in the other of said layers, at least some of the interstices between fibers of said first layer being of a width at least twice as large as the mean diameter of said synthetic wood pulp fibers in said second layer, at least some of the interstices between fibers of said second layer being of a width at least twice as large as the mean diameter of the fibers in said first layer, segments of at least some of the thermoplastic synthetic wood pulp fibers in said second layer being in contact with and heat fused with segments of fibers of said first layer, said thermoplastic synthetic wood pulp fibers in the second layer having a melting point lower than the melting point of degradation temperature of every other type of fibers contained in said two layers.

---

## 4,129,133
## INTERFERENCE-DETECTING DEMAND HEART PACEMAKER

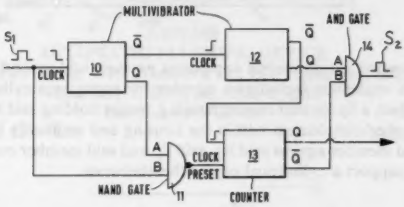
Werner Irnich, Reimser Str. 48, 51 Aachen, Germany, and Jacques de Bakker, Morettistr. 54, Vaals, Netherlands

Filed Mar. 4, 1977, Ser. No. 774,326
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1976, 2628629
Int. Cl.[2] A61N *1/36*
U.S. Cl. 128—419 PG 3 Claims

1. A heart pacemaker for generating a heart stimulation signal in the apparent absence of any heart stimulation signal during a given duration of time,

comprising, in combination:

interference detecting means operable for sensing intracardiac voltage signals possessing predetermined voltage waveform properties and operable for generating, respectively, first and second signals; said interference detecting means including a retriggerable monostable first multivibrator responsive to a trigger signal and operable for determining a first period of time, a NAND gate coupled to said first multivibrator, coupled to said trigger signal, a second multivibrator coupled to said first multivibrator and operable for initiating a second period of time, a flip flop device coupled to said NAND gate and said multivibrator and responsive thereto, and an AND gate coupled to said second multivibrator and said flip flop and operable for generating one of said second signals, thus inhibiting said heart stimulation signal, said first signal being generated in response to the sensing of one of said intracardiac voltage signals by said detecting means, and one of said second signals being generated whenever one of said voltage signals is not succeeded by another voltage signal during said predetermined first period of time; and




generating means coupled to said detecting means and operable for generating said heart stimulation signal at the completion of said predetermined second period of time subsequent to the occurrence of one of said second signals and operable to have said second period of time interrupted in response to the occurrence of a further one of said second signals.

---

## 4,129,134
## SMOKING ARTICLE

John D. Hind, and William C. Hopkins, both of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Continuation of Ser. No. 567,768, Apr. 14, 1975, abandoned, which is a continuation of Ser. No. 372,488, Jun. 22, 1973, abandoned. This application May 14, 1976, Ser. No. 686,409
Int. Cl.[2] A24D *1/18*
U.S. Cl. 131—2 5 Claims

1. A smoking article comprising tobacco parts and/or parts of a tobacco substitute and a wrapper comprising a film having as its main ingredient a natural polysaccharide selected from the group consisting of methylated pectins, guar gum, hydrolyzed guar gum and locust bean gum and mixtures thereof, said wrapper comprising, in addition to said main ingredient, from about 8 to about 40 parts, by weight, per 100 parts of said main ingredient, of an alkaline earth metal compound selected from the group consisting of calcium salts, magnesium salts and mixtures thereof, said wrapper also containing from about 2 to about 40 parts, by weight, per 100 parts of said main ingredient, of a humectant, said wrapper further having a heat shrinkage of greater than about 1% and less than about 16% and containing substantially no tobacco plant parts.

---

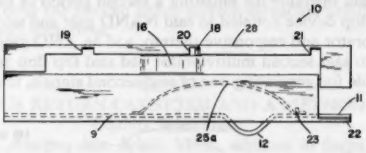
## 4,129,135
## SMOKER'S TOOL

Michael P. Kaufman; Randal S. Kochenderfer, and Frank A. Crivello, all of 826 Fulton SE., Minneapolis, Minn. 55414

Filed Dec. 15, 1977, Ser. No. 860,950
Int. Cl.[2] A24F *9/08*
U.S. Cl. 131—243 9 Claims

1. A smoker's tool comprising an elongated housing having a surface for supporting the smoker's tool on a table or the like,

said elongated housing having a first implement passage therein, a first smoker's implement slidably mounted in said first implement passage, means resiliently holding said first smoker's implement in slidable engagement in said first implement passage; a second implement passage located in said elongated housing, a second smoker's implement slidably




mounted in said second implement passage, said second smoker's implement including a member for engaging a cylindrical object, a lip located on said housing, means holding said second smoker's implement within the housing and resiliently biasing said member against said lip, said lip and said member coacting to support a cylindrical object therebetween.

---

**4,129,136**

## REJUVENATING ELECTROSTATOGRAPHIC CARRIER PARTICLES

**Devinder S. Kapoor, Penfield, N.Y., assignor to Rank Xerox Limited, London, England**

**Filed Aug. 19, 1977, Ser. No. 825,886**

**Claims priority, application United Kingdom, Aug. 25, 1976, 35346/76**

**Int. Cl.[2] B08B *7/00***

**U.S. Cl. 134—2** **13 Claims**

1. A method for rejuvenating electrostatographic carrier particles which have been employed in electrostatographic developer compositions of the kind comprising finely-divided electrostatographic toner particles electrostatically clinging to the carrier particles, said carrier particles comprising a metal core having combustible resinous material on the surface thereof, the method comprising fluidizing said carrier particles by passing a combustible gas and air mixture upwardly through a bed of said carrier particles, and heating said carrier particles in a fluidized condition to a temperature of from between about 420° C. and about 525° C. by burning said combustible gas and air mixture above said bed until said combustible resinous material on the surface of said core is removed, said core metal being selected from the group consisting of iron and steel, and said heating of said carrier particles being performed in the presence of a stoichiometric excess of oxygen with respect to the proportion of oxygen required for complete combustion of said combustible gas.

---

**4,129,137**

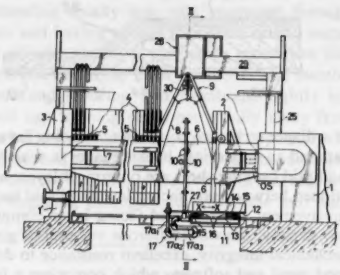
## WASHING APPARATUS FOR FILTER PRESS

**Tetsuya Kurita, Takarazuka, and Toshifumi Hara, Nishinomiya, both of Japan, assignors to Kurita Machinery Manufacturing Company Limited, Osaka, Japan**

**Filed Nov. 4, 1977, Ser. No. 848,728**

**Int. Cl.[2] B08B *3/02***

**U.S. Cl. 134—144** **8 Claims**




1. A washing apparatus for a filter press wherein when the filter plates are transferred one by one toward a movable end plate, a washing liquid spray pipe having a number of nozzles is positioned between the filter plates which are being successively separated as a result of the transfer and filter sheets each spread over adjacent filter plates or the filter surfaces with such filter sheets removed therefrom are washed by the spray pipe moving between adjacent filter plates, said washing apparatus comprising the following features:

a. the spray pipe is disposed outside of the filter plates so as to be parallel to one side of the filter plate and its one end opposed to a corner of the filter plate is pivotally mounted in a movable unit which is movable parallelly to the filter plates,

b. said movable unit is supported by a carriage movable in the direction of movement of the filter plates and is disposed, along with the movable unit, so as to move on said one side of the filter plates to which the spray pipe is installed parallelly and outside the filter plates,

c. means is provided for intermittently moving the carriage to position the spray pipe between separated filter plates in synchronism with the transfer of the filter plates one by one toward the movable end plate,

d. means is provided for forwardly and backwardly moving the movable unit in synchronism with the positioning of the spray pipe between separated filter plates by the carriage followed by the stoppage of the latter at that position, and

e. means is provided for forwardly turning the spray pipe to a position where it is parallel to an adjacent side of the filter plate which is at right angles with the firstmentioned side thereof to which the spray pipe is installed parallelly and for backwardly turning it to its initial position, in synchronism with the initial stage of the forward movement and the final stage of the backward movement of the movable unit.

---

**4,129,138**

## SYSTEMS FOR SUPPLYING TREATMENT LIQUIDS TO ROTATABLE ELECTROPLATING DRUMS

**Bror E. Nyström, Rosenvägen 21, S-560 23 Bankeryd, Sweden**

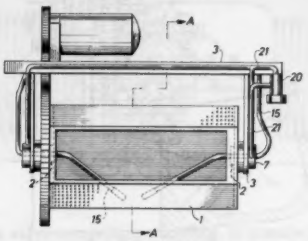
**Filed Nov. 25, 1977, Ser. No. 855,070**

**Int. Cl.[2] B08B *3/02***

**U.S. Cl. 134—145** **4 Claims**

1. A system for supplying varying quantities of treatment

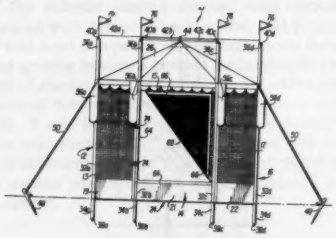
liquids, comprising an electroplating drum to which said treatment liquids are supplied, a frame, rinsing trunnion bearings defining a plurality of sets of ducts, a removable cleaning tube, and a liquid distribution valve, wherein said rinsing trunnion ducts rotatably mount said electroplating drum in said frame, at least one of said rinsing trunnion bearings defining a central through bore and at least two of said sets of ducts having different sized openings disposed in respective series about said central bore, and said liquid distribution valve is disposed in said frame and operates to select between allowing said at least



two sets of ducts to cooperate with each other and to perform separate rinsing functions, said through bore of said at least one rinsing trunnion bearing being defined by an inner surface thereof having axial flutes and said removable cleaning tube being inserted into said central bore, so that removal thereof makes said at least one set of ducts accessible for overhaul purposes, and said cleaning tube having a smooth cylindrical outer surface cooperating with said inner wall of said at least one rinsing trunnion bearing to define said at least one set of ducts.

---

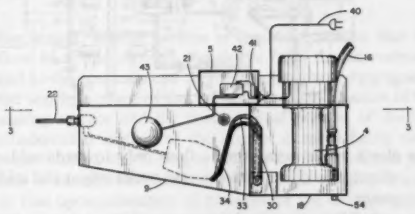
**4,129,139**
**BABY GAZEBO**
**Betsy K. Powers, 20 South Water St., Lewisburg, Pa. 17837**
**Filed Jul. 29, 1977, Ser. No. 820,241**
**Int. Cl.² E04B *1/12***
**U.S. Cl. 135—3 E** **12 Claims**



1. A portable shelter comprising:
a one-piece fabric assembly forming the roof, floor and sides of said shelter, said one-piece fabric assembly containing a plurality of sleeves running substantially the entire height of the sides of said shelter and located one each at the juncture of two sides of said shelter, at least one of the sides of said shelter having a larger upper portion of its surface area made of flexible netting fabric and a smaller bottom portion made of a solid lightweight flexible fabric, the remaining sides and floor of said shelter being made of said solid lightweight flexible fabric, said roof of said shelter having a first portion thereof made of said flexible netting fabric and a second portion thereof made of said solid lightweight flexible fabric,
a ring attached to said roof,
a plurality of poles each passing through a respective sleeve and having upper and lower ends extending outward of said sleeve, said upper end of each pole forming a tubular opening and said lower end of each pole terminating in a point which is adapted to be secured in the ground,
a plurality of relatively stiff wires,
a plurality of tapered resilient plugs associated one each with the ends of said wires, each end of each of said wires passing through an associated plug and having means for preventing the disengagement of said end from said associated plug, said plurality of plugs being respectively mounted in the tubular openings of said poles such that each of said wires passes through said ring and is attached to the upper end of two of said poles which are diametrically opposed about the center axis of said shelter, said wires serving to support the roof of said shelter.

---

**4,129,140**
**AUTOMATIC FLUSHING DEVICE**
**Richard D. Carlin, 4799 Primavera La., Las Vegas, Nev. 89122**
**Filed May 9, 1977, Ser. No. 795,327**
**Int. Cl.² F04F *10/00***
**U.S. Cl. 137—124** **8 Claims**



1. In a circulating water system wherein water is pumped from and returned to a sump, the system including a make-up water supply source, means for maintaining a constant water level in the sump, a circulating pump, and means for returning circulating water to the sump, the improvement therein which comprises a timing reservoir separate from and adjacent to the sump, means for supplying a constant flow of a portion of the circulating water to the timing reservoir, and a siphon drain having inlet means near the bottom of the sump and separate inlet means near the bottom of the timing reservoir, drain outlet means for removing water from the sump, and conduit means connecting the inlet means with the outlet means, such that both the sump and timing reservoir are simultaneously drained when the water level in either reservoir reaches a predetermined level.

---

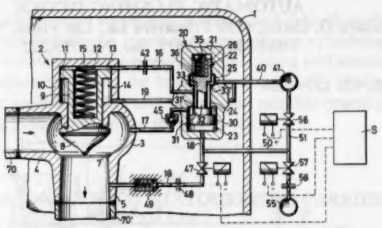
**4,129,141**
**SCRAM VALVE**
**Ernst Vogeli, Wiesendangen, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland**
**Filed Mar. 15, 1976, Ser. No. 666,919**
**Claims priority, application Switzerland, Mar. 20, 1975, 3561/75**
**Int. Cl.² F16K *17/10***
**U.S. Cl. 137—462** **8 Claims**

1. A scram valve comprising
a casing having an inlet spigot, an outlet spigot for a flow of medium and a valve seat between said spigots;
a movable valve body for seating on said valve seat to close said outlet spigot to the flow of medium;
a lid on said casing defining a cylindrical chamber;
a closing piston head slidably mounted in said cylinder chamber to sub-divide said chamber into a pair of sub-chambers;
a rod connecting said piston head to said valve body;
a pressure medium supply line connected between said casing and one of said sub-chambers to deliver a pressure medium thereto from said casing for moving said valve body into closing relation with said outlet spigot;

a low pressure chamber connected to the other of said sub-chambers;

a pilot valve in said pressure medium supply line for selectively opening and closing said supply line to said casing, said pilot valve including a control piston and a line communicating one end of said control piston with the flow of medium in said casing near said outlet spigot whereby said latter piston moves into an opening position in said supply line in response to an abrupt pressure decrease downstream of said valve seat to allow the pressure medium in said supply line to flow into said one sub-chamber to cause said valve body to seat on said valve seat;

a line connected between said outlet spigot and said end of said control piston;



a check valve permitting a flow only towards said outlet spigot in said line between said outlet spigot and said pilot valve;

a second line connected between said low pressure chamber and said first line between said outlet spigot and said control piston, said second line being connected to said first line between said check valve and said control piston;

a third valve in said second line; and

a safety circuit connected to said third valve to operate said third valve in response to a predetermined instruction signal to connect said low pressure chamber to said first line.

---

**4,129,142**

## SAFETY DEVICE FOR A RELIEF VALVE WITH A CONTROLLED DISK

**Jean Solowy, Sens, France, assignor to FMC Corporation, San Jose, Calif.**

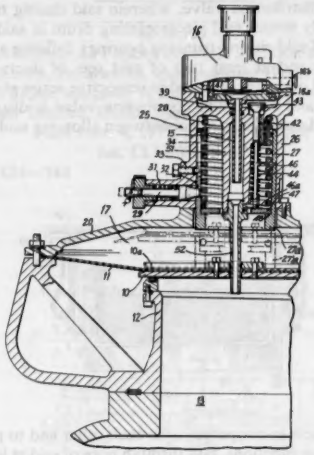
**Filed Aug. 19, 1977, Ser. No. 825,891**

**Claims priority, application France, Apr. 27, 1976, 76 12451**

**Int. Cl.[2] F16K *17/19***

**U.S. Cl. 137—492** **7 Claims**

1. A safety device for a relief valve of a pressurized fluid storage tank, of the type comprising a disk closing member carried by a diaphragm forming a wall of a chamber further limited by the valve casing, and a pilot valve forming a three-way cock, a first line being connected to said tank, a second line being connected to said chamber and a third line being connected to open air, so as to enable said chamber to be connected either to the inner space of the tank or to the open air, according to pressure inside said tank, characterized in that it comprises a body provided for being mounted between said valve casing and said pilot valve, a spring biased slidably movable cage inside said body, means being provided for either maintaining said cage in a locked position or allow it to be moved under pressure of said spring, the cage then engaging said valve disk, said body comprising a first communication means for connection of inner space of storage tank to the first line of said pilot valve, and a second communication means for connection of inner space of said chamber to the second line of



said pilot valve, said second communication means being closed when said cage is in the unlocked condition.

---

**4,129,143**

## CHECK VALVE, ESPECIALLY FOR VACUUM-OPERATED INSTALLATIONS IN MOTOR VEHICLES

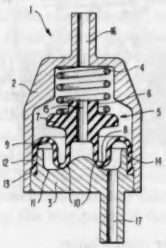
**Rüdiger Hoffmann, Sindelfingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany**

**Filed Jun. 22, 1977, Ser. No. 808,953**

**Claims priority, application Fed. Rep. of Germany, Jun. 24, 1976, 2628314**

**Int. Cl.[2] F16K *15/14***

**U.S. Cl. 137—496** **10 Claims**

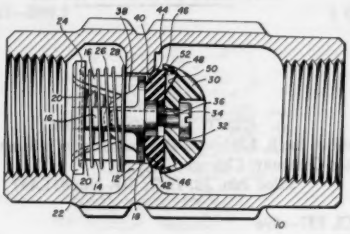


1. A check valve, comprising a two-partite housing means provided with inlet and outlet channel means and a roller diaphragm means pressed by a prestressed spring against its sealing seat means and secured between the housing parts of the two-partite housing means, characterized in that the roller diaphragm means includes an annularly shaped curved portion which as movable sealing part cooperates with the bottom of the one housing part constructed as sealing seat means in such a manner that a central bore provided in the section of the diaphragm means located on the side of the spring connects the inlet channel means terminating outside of the curved diaphragm portion, with the outlet channel means of the other housing part, when, upon exceeding a predetermined pressure difference, the curved diaphragm portion lifts off from the sealing seat means.

## 4,129,144
## STABILIZING CHECK VALVE

Bo Allan Andersson, R.D. No. 2, Cambridge, N.Y. 12816, and Richard P. Callahan, P.O. Box 164, Hoosick Falls, N.Y. 12090

Filed Nov. 16, 1976, Ser. No. 742,271
Int. Cl.[2] F16K *15/06*
U.S. Cl. 137—541 3 Claims



1. A check valve comprising a housing, an annular abutment in the housing forming a central opening, and a check valve assembly mounted on said abutment, said abutment having a valve seat thereon,

said assembly comprising a guide, a spring mounted between portions of the guide and said abutment normally tending to hold the check valve assembly substantially in upstream closed position,

a head on said guide, said head being located at the downstream side of the abutment, said head having a base facing the abutment,

an elastomeric disc between the base of the head and the abutment, said elastomeric disc having a diameter greater than the opening through the abutment, and the base of the head having a recess therein facing the disc and receiving portions of said disc under conditions of retropressure, the disc having a stability normally maintaining it generally free of the recess,

said head being substantially conical and having a flat apex area facing downstream, a fastener having a fastener head located in the flat apex area of said conical head and a part of the fastener passing through said conical head and secured with respect to said guide, said recess in the base of said head comprises an annular groove facing said disc, said groove having a bottom inclined with respect to the axis of the housing and of the check valve assembly, said inclined bottom extending from a central portion of the base of said head outwardly and in a downstream direction, said elastomeric disc having a rounded surface facing said abutment and said valve seat, and means on the guide to anchor said spring at the end thereof opposite said abutment.

---

## 4,129,145
## CHECK VALVE ASSEMBLY

James M. Wynn, 2203 McLaughlin Ave. #4, San Jose, Calif. 95122

Filed May 26, 1977, Ser. No. 800,661
Int. Cl.[2] F16K *15/02*
U.S. Cl. 137—541 8 Claims

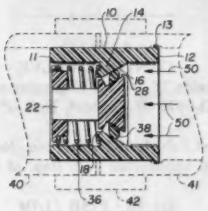
1. A check valve assembly comprising:

a valve body having an upstream end and a downstream end;

a valve seat located on the interior of the valve body and having an annular seating surface directed toward the downstream of the valve body, said seating surface being inclined at an acute angle relative to the centerline of the valve body;

a poppet element having a circumferential surface with a relatively narrow neck located proximate the valve seat, the circumferential surface of the poppet element on the upstream side of the neck and downstream of the valve seat having an outer diameter less than the inner diameter of the valve seat so that the poppet element cannot contact the valve seat on the downstream side thereof upon closure of the valve, the circumferential surface of the poppet element on the downstream side of the neck having a frustoconical configuration inclined at an acute angle relative to the centerline of the valve body substantially equal to said acute angle of the seating surface; and

a deformable resilient O-ring circumscribing the poppet element and located in the narrow neck, the outer diameter of the O-ring being greater than the inner diameter of



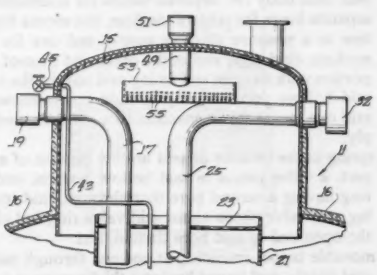
the annular seating surface of the valve seat so that the flow of a fluid through the sleeve from the downstream end to the upstream end thereof presses the O-ring against the seating surface of the valve seat, the inclination of the seating surface and the frustoconical portion of the circumferential surface of the poppet element being sufficient to allow the O-ring to roll up the frustoconical portion of the circumferential surface of the poppet element so that upon relaxation of pressure of the O-ring against the seating surface, the O-ring readily releases from the seating surface without sticking thereto.

---

## 4,129,146
## LIQUEFIED GAS TANK AND METHOD OF FILLING

Alan L. Schuler, Hingham, Mass., assignor to General Dynamics Corporation, St. Louis, Mo.

Filed May 13, 1977, Ser. No. 796,550
Int. Cl.[2] F17C *5/02*
U.S. Cl. 137—587 11 Claims



1. A tank for holding liquefied gas designed for filling without problem of thermal roll-over, which tank comprises

a fluidtight body which defines a liquid storage vessel,

thermal insulation means in association with said body to provide a thermal barrier between the low temperature environment inside said vessel and ambient,

a liquid supply line into said vessel for filling said vessel with liquefied gas and terminating at a location within the upper half of said vessel,

means for connecting said supply line to a source of liquefied gas,

draft-tube means within said vessel extending generally vertically from a location within the upper-quarter thereof to a location within the lower-quarter thereof,

discharge pipe means in addition to the supply line for emp-

tying liquefied gas and extending from a location near the bottom of said vessel,

said supply line being located so as to discharge the liquefied gas being supplied within the confines of said draft-tube,

said draft tube having a cross sectional area at least about ten times the cross sectional area of supply line, and

the upper end of said draft-tube being in fluid communication with the ullage portion of said vessel and the lower end of said draft-tube being in liquid communication with said liquid-holding portion of said vessel whereby the possibility of thermal roll-over during filling is substantially eliminated.

---

**4,129,147**

## CONTROL VALVE

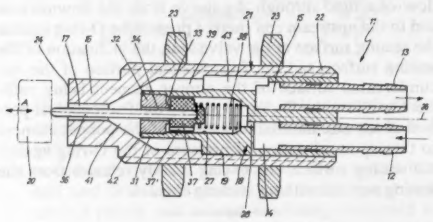
**Kurt Stoll, Lenzhalde 72, D-7300 Esslingen, and Ulrich Kees, Im Pfeifferwald, D-6670 St. Ingbert, both of Fed. Rep. of Germany**

**Filed Feb. 1, 1977, Ser. No. 764,560**

**Claims priority, application Fed. Rep. of Germany, Feb. 17, 1976, 2606177**

**Int. Cl.[2] F15B *13/04***

**U.S. Cl. 137—596.1** **6 Claims**



1. A control valve comprising:

a generally hollow main body which is generally open at one end and at the opposite end has a nozzle integrally connected thereto, the nozzle having a central bore therethrough and a flat external annular sealing surface;

a valve part positioned inside of the main body, the valve part having at one end adjacent the generally open end of said main body two separate means for connection to two separate hoses for control medium, one means for connection to a pressure medium supply and one for pressure medium discharge, and at the other end thereof a hollow portion with an open end facing said nozzle, the interior of said hollow portion being in fluid communication with said one means for connection to a pressure medium supply;

a spring in the interior of said hollow portion of said valve part, a valve piston in said hollow portion, and a valve ring having a central bore therethrough, said spring biasing said valve piston aginst said valve ring and closing off the open end of said bore therein; and

a movable tappet extending at one end through said bore in said nozzle, said tappet having a thickness so as to leave an annular space for fluid flow between said tappet and said nozzle bore, and extending so as to abut against an external sealing element, said tappet extending at its opposite end through the bore in said valve ring and abutting against said valve piston, an annular space for fluid flow being left between said tappet and said bore in said valve ring, said annular space for fluid flow between said tappet and the wall of said valve ring forming the bore therethrough through which said tappet being smaller than said annular space for fluid flow between said tappet and said bore in said nozzle;

the hollow interior wall of said main body forming a bottleneck zone together with the open end of said portion of said valve part such that upon movement of said tappet against the bias of said spring so as to open said central bore of said valve ring, pressure medium from said one means for connection to a pressure medium supply will flow through said annular space in said nozzle, whereas when said bore in said nozzle is closed off by said sealing element, pressure medium will be caused to flow through said one means for pressure medium discharge.

---

**4,129,148**

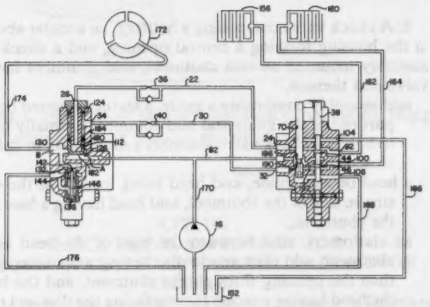
## CLUTCH MODULATOR

**Richard J. Lech, Lockport, Ill., assignor to International Harvester Company, Chicago, Ill.**

**Filed Jun. 30, 1977, Ser. No. 811,497**

**Int. Cl.[2] B60K *41/00***

**U.S. Cl. 137—596** **9 Claims**



1. A modulator valve assembly comprising:

a modulator valve body having a plurality of spool receiving bores and a plurality of internal passages;

said spool receiving bores including a direction selector spool bore, a dump valve bore, a modulator spool bore terminating in a seat and a poppet bore terminating in a seat;

said plurality of internal passages including a first drain passage **104**, a forward modulator fluid source passage **24**, a forward clutch supply passage **90**, a supply port passage **82**, a distributor passage **192**, a reverse clutch supply passage **96**, a reverse modulator fluid source passage **32**, a second drain passage **106**, a forward modulator control passage **26**, a reverse modulator control passage **34**, a torque converter supply passage **130**, a regulator passage **150** and a regulator drain passage **154**;

a direction selector spool slideably carried in said direction selector spool bore movable between a forward neutral and reverse positions, having a shaft equipped with a first and second land and a detent portion at one end of said direction selector spool;

a dump valve spool slideably carried in said dump valve bore having an upper and lower dump valve lands and further provided with an internal passage made up of a first radial passage connected to a second radial passage via a longitudinal passage therebetween;

a modulator spool slideably carried in said modulator spool bore having a tapered nose urged toward said modulator spool bore seat by a spring;

a regulator poppet slideably carried in a poppet bore, said regulator poppet having an apertured nose allowing fluid communication to an internal bore of the poppet, said regulator poppet urged to said poppet bore seat by a spring.

**4,129,149**

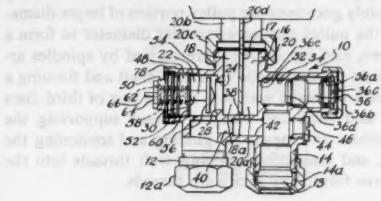
## CONTROL VALVE MEANS

**Roland Brehmer, Fellingsbro, and Bengt Sörberg, Kungsör, both of Sweden, assignors to Aktiebolaget Fellingsbro Verkstader, Fellingsbro and Erik Sorberg Armaturfabrik Aktiebolag, Kungsör, both of, Sweden**

**Continuation of Ser. No. 616,850, Sep. 25, 1975, abandoned. This application Feb. 7, 1978, Ser. No. 875,899**

**Int. Cl.[2] F17D *3/00*; F16K *43/00***

**U.S. Cl. 137—599.1** **8 Claims**



1. A central heating radiator control valve comprising (a) a valve housing having:

(i) an inlet, a main outlet and a branch outlet arranged for flow of heating fluid from the inlet to the branch outlet and return flow through the branch outlet to the main outlet;

(ii) a fixed planar longitudinal partition dividing the branch outlet into side-by-side relatively isolated flow and return passages;

(iii) a first valve passageway axially transverse to the branch outlet and communicating the inlet to the flow passage, the first valve passageway and flow passage defining a first valve port therebetween;

(iv) a second valve passageway axially transverse to the branch outlet and communicating the return passage to the main outlet, the return passage and second valve passageway defining a port therebetween;

(v) a first valve seating in the first valve passageway around the first valve port;

(vi) a second valve seating in the second valve passageway around the second valve port; and

(vii) (a) a bypass conduit with its axis parallel to the axes of the first and second valve passageways for bypass flow direct from the inlet to the main outlet; (b) a main control valve member mounted in the first valve passageway for linear movement axially of the passageway towards and away from the first valve seating to vary the flow through the branch outlet in the normal operation of the valve; and (c) a second, settable, valve member mounted in the second valve passageway for linear movement axially of the passageway and independent of the main control valve member to limit the flow through the branch outlet; the cross-sectional flow area of the bypass conduit being independent of the positions of the main and second valve members in the normal operation of the valve, the bypass conduit remaining open in all operative positions of the main control valve member, and the valve ports being closable by the respective valve members to isolate the branch outlet.

---

**4,129,150**

## FLUID DISTRIBUTOR AND FLUID DISTRIBUTOR CELL

**Marc Boisserand, "Le Placyre", Voiron, France (F-38500)**

**Filed Mar. 31, 1977, Ser. No. 783,228**

**Claims priority, application France, Apr. 5, 1976, 76 09868**

**Int. Cl.[2] F16K *27/00***

**U.S. Cl. 137—872** **8 Claims**

1. A fluid distributor cell comprising:

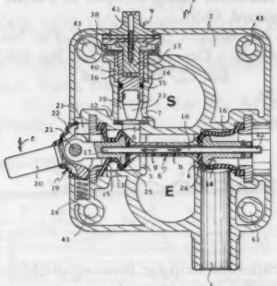
a block of rigid material, said block being pierced in the direction of its thickness by at least one intake orifice and one evacuation orifice;

a fluid discharge conduit;

an intake port in fluid communication between said intake orifice and said discharge conduit;

an evacuation conduit in fluid communication between said intake orifice and said evacuation orifice;

means for alternatively obturating the flow of liquid from said intake orifice to said discharge conduit and to said evacuation conduit;



valve means for regulation of the rate of flow of liquid through said evacuation conduit such that, when said discharge conduit is obturated, the flow through said evacuation conduit is at a value equal to that through said discharge conduit when said evacuation conduit is obturated;

whereby, by actuating said obturating means, a fluid flow introduced into said intake orifice can be carried either to said discharge conduit or, at the same flow rate, to said evacuation orifice.

---

**4,129,151**

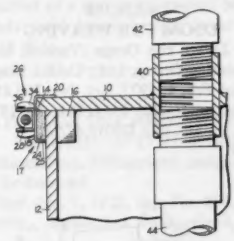
## CAP FOR RELEASABLY COVERING WELL CASINGS

**F. Gene Henson, 806 SE. 8th St., Grants Pass, Oreg. 97526**

**Filed Apr. 27, 1978, Ser. No. 900,471**

**Int. Cl.[2] F16L *55/10***

**U.S. Cl. 138—89** **5 Claims**



1. A cap for covering the open top of a tubular cylindrical well casing and for supporting a submersible pump, comprising:

(a) a thin planar circular cross-sectioned cover plate having a diameter which is slightly greater than the outside diameter of said well casing so as to form an overhanging lip;

(b) an expandable, semicircular clamp ring having a nominal diameter which is substantially equal to the diameter of said cover plate;

(c) said clamp ring having an inwardly extending upper rim which is arranged to fit over said lip of said cover plate;

(d) a compressible annular gasket having a thickness which is greater than the depth of said overhanging lip;

(e) said gasket being attached to said clamp ring a spaced distance below said upper rim in a manner to snugly receive said overhanging lip therebetween; and

(f) fastener means asssociated with the respective ends of said clamp ring for urging said ends together upon tightening of said fastener means so as to squeeze said gasket between said clamp ring and said well casing.

---

**4,129,152**

## DOUBLE WALL HELICAL PIPE AND STRIP CONFIGURATION FOR FORMING SAME

**Paul K. Davis, Alameda, Calif., assignor to Pacific Roller Die Co., Inc., Hayward, Calif.**

**Division of Ser. No. 401,167, Sep. 27, 1973, Pat. No. 3,857,159. This application Oct. 21, 1974, Ser. No. 516,225**

**Int. Cl.[2] F16L** *9/16*

**U.S. Cl. 138—154** **9 Claims**

1. A configuration of strip for forming double wall helical seam pipe by curling a single workpiece, comprising in uniform cross-section:

a. a right angle flange formed along one side edge portion of said strip and projecting to a side of the plane of said strip and defining a first pipe seam element;

b. a U-shaped portion formed along the side edge portion opposite said one side edge portion and projecting to the same side of the plane of said strip as said flange for defining a second pipe seam element;

c. a U-shaped portion formed longitudinally of said strip midway between and to the same side of the plane of said strip as said first and second seam elements and defining a third seam element;

d. said third seam element being proportional for receipt of said first seam element and said second seam element being proportioned for receipt of said third seam element; and

e. strip portions respectively extending between said first seam element and said third seam element and between said second seam element and said third seam element.

---

**4,129,153**

## LOOM FOR WEAVING

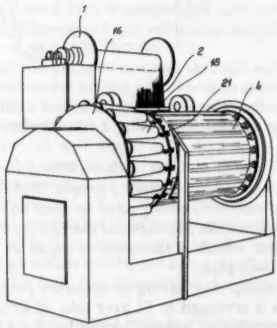
**Danillo Bonetti, Jerago con Orago (Varese), Italy, assignor to Bentley Engineering Group, Ltd., United Kingdom**

**Filed Feb. 4, 1977, Ser. No. 765,616**

**Claims priority, application Italy, Feb. 10, 1976, 20024 A/76**

**Int. Cl.[2] D03D** *47/00*

**U.S. Cl. 139—28** **7 Claims**



1. A loom comprising a drum rotating on a rotary shaft, means for feeding the warp threads on the drum, means for inserting weft threads into sheds formed by the warp threads, peripheral weft bobbins and means for collecting the woven cloth, said drum consisting of two first coaxial discs spaced one from the other at a predetermined distance along said shaft, a plurality of second discs arranged in rows and mounted between said two first discs, each of said second discs having a first pulley portion and a second pulley portion, the first pulley portion being of greater diameter and the second pulley portion being of smaller diameter, one of the warp threads alternately going over the pulley portion of smaller diameter and then the pulley portion of larger diameter while another warp thread alternately goes over the pulley portion of larger diameter and then the pulley portion of smaller diameter to form a crossed pattern, said second discs are carried by spindles arranged axially at equal distance from said shaft and forming a cylindrical surface coaxial with said shaft, a pair of third discs mounted on said shaft and carrying means supporting the peripheral bobbins and means for guiding and tensioning the weft threads; and means for inserting weft threads into the crossed patterns formed by said warp threads.

---

**4,129,154**

## ELECTRONIC DEVICE FOR CONTROLLING THE WINDING OFF OF MATERIAL WOUND UP ON A CORE BY TENSIOMETRIC CONTROL

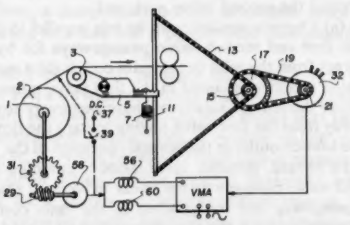
**Dore D. Bennelli, Via Goletti 3, Borgo Ticino (Novaro), Italy (28040)**

**Continuation-in-part of Ser. No. 707,502, Jul. 22, 1976, abandoned. This application Jan. 5, 1978, Ser. No. 866,952**

**Claims priority, application Italy, Aug. 8, 1975, 26225 A/75**

**Int. Cl.[2] D03D** *49/06*

**U.S. Cl. 139—110** **7 Claims**



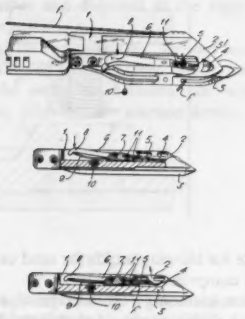

1. A low inertia control device, for the continuous electromechanical control of the winding-off of a warp yarn wound up on a warp beam by sensing the tension of the wound-off yarn, said device comprising, in combination, an induction motor; reduction gearing, with a high reduction ratio and a substantial irreversibility, drivingly connecting said induction motor to said warp beam; yarn tension detecting means engaging the wound-off warp yarn; an electronic speed control connected between a source of potential and said induction motor and operable to infinitely vary the speed of said motor and to brake said motor substantially instantaneously; and a tension-potential transducer connected to said yarn tension detecting means and forming part of said electronic speed control, and operable to control said electronic speed control to continuously modulate the potential applied to said motor in accordance with the detected tension of the wound-off warp yarn to continuously modulate the speed of said motor to maintain constant the tension of the wound-off warp yarn.

4,129,155

## WEFT CARRYING GRIPPER FOR SHUTTLELESS LOOMS WITH STATIONARY WEFT SUPPLY

Alberto Merisio, Colzate (Bergamo), Italy, assignor to Somet Societa' Meccanica Tessile S.p.A., Gazzaniga (Bergamo), Italy

Filed Oct. 4, 1976, Ser. No. 729,367
Claims priority, application Italy, Oct. 3, 1975, 27927 A/75
Int. Cl.[2] D03D *47/20*
U.S. Cl. 139—448 2 Claims



1. A weft carrying gripper for shuttleless looms with stationary weft supply, comprising a jaw stationary relative to the gripper, a rigid elongated lever pivoted intermediate its length on the gripper, a metallic lamina carried by one end of the rigid lever, a leaf spring carried by the same end of the lever and urging the lamina toward said jaw, and means acting on the other end of the lever yieldably to urge the lever in a direction in which said lamina moves toward said jaw, said lamina and said leaf spring being secured to opposite sides of the same said end of said lever.

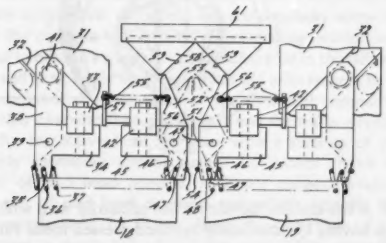
---

4,129,156

## METHOD AND CONSTRUCTION FOR SPIRAL WIRE BINDING OF PADS

Ernst Pfaffle, Neuffen, Germany, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 11, 1977, Ser. No. 823,634
Int. Cl.[2] B21F *11/00*
U.S. Cl. 140—92.4 6 Claims



1. In a coil binding machine of the type having a carriage, means on said carriage for supporting a pair of perforated sheet groups in closely spaced side-by-side relation, and means for moving said carriage to successive stations for aligning, coil feeding, and trim-cutting and bending said coils, the improvement comprising a trim-cutting and bending assembly for the adjacent ends of said side-by-side sheet groups, said assembly comprising a pair of fixed cutter members engageable with said adjacent coil ends, a cutter blade pivotally mounted on each cutter member and movable between a retracted position and a cutting position, spring means urging each cutter blade to its retracted position, the blades having cutting portions at one end and cam followers extending therefrom, at the other end, the pivots being located between these ends whereby the ends will swing in opposite directions, and a V-shaped cam having side surfaces simultaneously engageable with said followers to urge said blades toward their cutting positions against the action of said spring means.

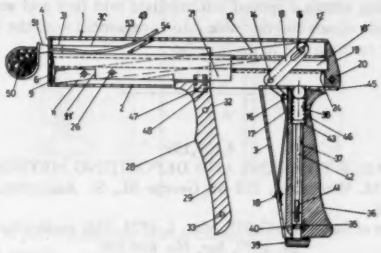
---

4,129,157

## TOOL FOR TENSIONING AND CUTTING SELF-LOCKING STRAPS

Alessandro Sciolotto, Turin, Italy, assignor to ITW Fastex Italia, Sp.A, Turin, Italy

Filed Nov. 1, 1977, Ser. No. 847,628
Claims priority, application Italy, Nov. 25, 1976, 29737 A/76
Int. Cl.[2] B21F *9/02*
U.S. Cl. 140—123.6 11 Claims



1. A tool for tightening and cutting self-locking straps, of the type comprising two jaws intended to restrain and tension the tail of the self-locking strap, a lever for actuating said jaws, a lever for actuating a blade intended to cut the exceeding portion of said strap, and a device for locking said blade actuating lever which unlocks said lever only when the tension exerted on said strap has reached a predetermined value, characterized in that one of said jaws is integral with said jaw actuating lever and the other jaw is integral with a slide adapted to slide on a guide parallel to the direction in which said strap is tensioned against the reaction of a spring interposed between said slide and a tool body, said jaw actuating lever being pivotally mounted on said slide.

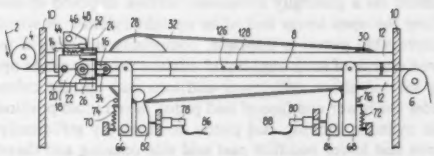
---

4,129,158

## APPARATUS FOR THE REINFORCEMENT OF LENGTHS OF COIL WIRE

Hans Schmid, Ruschlikon, Switzerland, assignor to Meteor AG, Ruschlikon, Switzerland

Filed Jun. 7, 1977, Ser. No. 804,240
Claims priority, application Switzerland, Jun. 9, 1976, 7241/76
Int. Cl.[2] B21F *7/00*
U.S. Cl. 140—149 9 Claims



1. Apparatus for reinforcing a length of wire by forming the wire into loops and twisting the formed loops together comprising:

first and second means for passing a continuous length of wire along a path, said first and second passing means

being spaced apart a selected distance to define a substantially straight line for said path,

first and second guide means each spaced apart a selected distance from each other along said path with said first guide means being located near said first means for passing and said second guide means being located near said second means for passing,

wire transport means for engaging and carrying the wire, means for moving said wire transport means along a predetermined route including means for linearly reciprocating said transport means over said selected distance to bring consecutive lengths of wire into contact alternately with said first guide means and then with said second guide means so that said lengths of wire become supported on said guide means and extend in loops therebetween, the number of said loops corresponding to the number of traversals of said predetermined route by said wire transport means,

twisting means disposed intermediate said first and second guide means and movable into engagement with the loops for twisting the loops together.

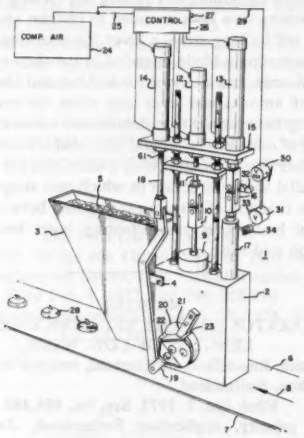
---

**4,129,159**

## CHARGE FORMING AND DEPOSITING METHOD

**Henry M. Whetstone, 282 St. George St., St. Augustine, Fla. 32084**

**Division of Ser. No. 663,901, Mar. 4, 1976. This application Jul. 27, 1977, Ser. No. 819,396**
**Int. Cl.[2] B65B *3/04***
**U.S. Cl. 141—1** **7 Claims**



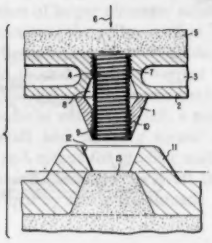

1. In the manufacture of candy patties, the method of depositing a measured charge of sticky semi-liquid candy or the like mixture on a generally horizontal surface disposed spacedly below the open lower end of an upright cylinder in which a reciprocable piston is disposed, comprising injecting a measured charge of such semi-liquid mixture through a side opening located above said lower end into said upright cylinder under the lower end face of said piston in retracted position in said cylinder, moving said piston downwardly sufficiently to move said lower end face past said side opening and therebeyond to carry such measured charge on its said face downwardly beyond said lower end of said cylinder and continuing such downward movement until such charge comes in contact with such surface, and thereafter raising said piston away from the charge so deposited on said surface and into said retracted position with its said end face above said side opening.

**4,129,160**

## NOZZLE FOR BLOWING MOLDS OR CORES FOR SAND CASTING

**Henry Lenglet, Les Clayes sous Bois, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France**

**Filed Oct. 21, 1977, Ser. No. 844,172**
**Claims priority, application France, Nov. 9, 1976, 76 33686**
**Int. Cl.[2] B65D *25/40*; B22C *15/24***
**U.S. Cl. 141—388** **7 Claims**



1. A nozzle for blowing molds for sand casting in sand core boxes which comprises:

a filling plate, including a threaded passage of predetermined pitch and diameter provided therein, for injecting sand into such sand core boxes, said nozzle being secured to said filling plate and also including a threaded passage provided therein having the same pitch and diameter as said threaded passage of said filling plate; and,

a helical spring, with contacting turns of diameter and pitch corresponding to that of said threaded passage of said filling plate and said nozzle, screwed into said threaded passage of said filling plate and said nozzle so as to form a flexible coupling therebetween.

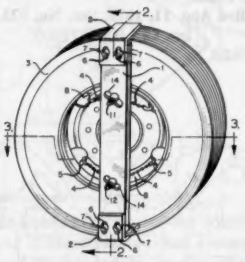
---

**4,129,161**

## TRACTION DEVICE FOR TIRES

**Roberto Quintana, 1904 N. 74th Ct., Elmwood Park, Ill. 60635**

**Filed Oct. 13, 1977, Ser. No. 841,744**
**Int. Cl.[2] B60C *27/20, 27/04***
**U.S. Cl. 152—225 R** **4 Claims**



1. A tire traction device for use primarily with wheels of the type having symmetrically opposed pressed metal rim support members which comprises:

a mounting bar for traversing the outside of a wheel with the center of the bar positionable approximately next to the center of the wheel and the ends of the bar extending approximately to the tread of the tire;

a traction shoe connected to each end of the mounting bar at right angles to the bar so as to overlie the tire tread;

a first and a second flexible line segment;

a hook attached to the end of each of the first and second line segments, one hook being capable of engaging with the edge of a first rim support member of the pressed metal type and disposed to the left of said mounting bar, and the

other hook being capable of engaging with the edge of the first rim support member and disposed to the right of said mounting bar;

a third and a fourth flexible line segment;

a hook attached to the end of each of the third and fourth line segments, one hook being capable of engaging with the edge of a second rim support member symmetrically opposed to the first rim support member and disposed at the left side of said mounting bar, and the other hook being capable of engaging with the edge of the second rim support member and disposed at the right side of said mounting bar; and

means mounted on the mounting bar and attached to the ends of the flexible line segments opposite the hooks for tensioning the segments between the wheel and the mounting bar, whereby the traction device is secured to the wheel.

---

**4,129,162**

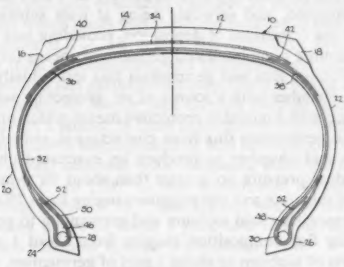
## PNEUMATIC TIRE

**Marion A. DeWitt, North Canton, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio**

**Filed Jul. 12, 1976, Ser. No. 704,635**

**Int. Cl.[2] B60C *9/06***

**U.S. Cl. 152—354 RB** **5 Claims**



**1.** A pneumatic tire comprising a ground contacting tread portion, a pair of sidewall portions extending radially inwardly from the axial outer edges of said tread portion and terminating at each radial inner extremity in a bead portion, a single carcass ply of tire cord fabric extending circumferentially about the tire with the cords in said carcass ply extending continuously from bead to bead in a generally radial direction in the sidewall portions and at an angle no greater than 45° with respect to the mid-circumferential centerplane of the tire, said carcass ply being further characterized in that each end thereof is wrapped around the respective bead portions with a turn-up of said carcass ply extending approximately 1.5 inches above the centerline of said bead portion, a flipper section wrapped around each of said bead portions and which extends to a height approximately 1.5 inches above the centerline of said bead portion, a single belt ply of tire cord fabric extending circumferentially about the tire and terminating in the axial direction adjacent the axial outer edges of the tread portion, said belt ply having continuous cords extending from one side of the belt to the other side, and a pair of shoulder strips extending circumferentially about the tire at each axial outer edge of said belt ply and having a portion thereof overlapping with said belt ply and wherein the angle formed by the cords of said shoulder strips with respect to the mid-circumferential centerplane is at least 5° greater than the angle formed by the cords of said belt ply with respect to the mid-circumferential centerplane.

**4,129,163**

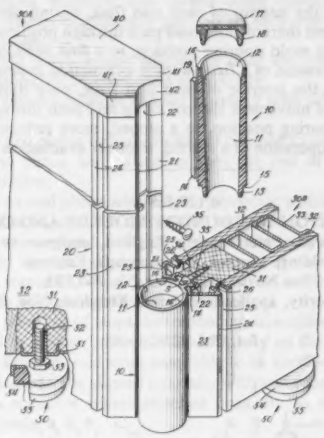
## PANEL ASSEMBLY AND COMPONENTS THEREOF

**Bernard L. Johnson, Bellevue, Wash., assignor to The Haws Corporation, Elkhart, Ind.**

**Filed Sep. 17, 1975, Ser. No. 614,262**

**Int. Cl.[2] A47G *5/00***

**U.S. Cl. 160—135** **44 Claims**



**1.** A panel assembly which comprises

(1) panels;

(2) a segmented cylindrical column the segments of which are individually rotatable;

(3) panel connecting means on each segment;

(4) segment connecting means on each panel;

(5) said panels being connected to different segments; and

(6) said segment connecting means having an arcuate portion conforming to the curvature of said column, which subtends an angle of 360/X° wherein X is a small integer of at least 2, and side portions extending out radially from the sides of said arcuate portion and forming an angle between them of 360/X°, whereby up to X panels can be attached to said column and when only two panels are attached, one can be rotated with respect to the other through an angle of 360 (1−2/X) degrees.

---

**4,129,164**

## VACUUM FORMING OR REDUCED-PRESSURE MOULDING

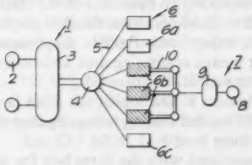
**Kiyoshige Torikai, Mihara, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Jan. 24, 1977, Ser. No. 762,184**

**Claims priority, application Japan, Mar. 15, 1976, 51-29891[U]**

**Int. Cl.[2] B22C *15/22*; B22D *27/16, 47/02***

**U.S. Cl. 164—7** **4 Claims**



**1.** In a method of reduced-pressure molding of the type wherein a plurality of mold flasks are sequentially moved along a path through a mold shaping position whereat a mold is formed within each flask, a mold pouring position whereat

molten metal is poured into the mold formed within each flask to form a casting, a mold disintegration station whereat the mold in each flask is removed from the casting formed therein, and back to said mold shaping position, and wherein the interiors of said plurality of flasks are subjected to a reduced pressure during movement along said path, the improvement wherein said reduced pressure is applied by the steps comprising:

subjecting the interior of each said flask, during periods of movement thereof along said path through positions other than said mold pouring position, to a first reduced pressure operation of a first, weaker evacuation means; and

subjecting the interior of each said flask, only during the period of movement thereof along said path through said mold pouring position, to a second, more reduced pressure by operation of a second, stronger evacuation means.

---

**4,129,165**

## PREPARATION OF FOUNDRY MOULDS AND CORES

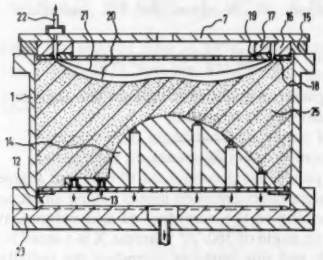
**Albert Edwards, Peterborough, England, assignor to Baker Perkins Holdings Limited, Peterborough, England**

**Filed Nov. 2, 1977, Ser. No. 847,931**

**Claims priority, application United Kingdom, Nov. 2, 1976, 45469/76**

**Int. Cl.² B22C 9/00**

**U.S. Cl. 164—7** **12 Claims**



1. A method of preparing a foundry form by a cold-set process, comprising:

introducing a mixture of foundry sand and a binder into a form box;

covering an open end of the form box with sealing means comprising a first, fluid-pervious, flexible diaphragm backed by a second, impervious, flexible diaphragm;

applying suction to the form box to draw the second diaphragm against the first diaphragm and the first diaphragm against the surface of the mixture in the form box to compact the mixture; and

subsequently introducing a fluid hardening medium between the first and second diaphragms so that it passes through the first diaphragm, permeates the mixture within the form box, and causes the binder to harden the mixture.

4. Apparatus for preparing a foundry form, comprising:

a form box a pair of opposed sealing means for sealing against opposite ends of the form box, the first sealing means covering an open end of the form box and comprising a first, fluid-pervious, flexible diaphragm backed by a second, impervious, flexible diaphragm, and the second sealing means sealing against at least one aperture in the opposite end of the form box;

means adjacent to the top of the form box for retaining the first and second sealing means against the respective ends of the form box;

means associated with the form box for applying suction to the second sealing means to draw the second diaphragm against the first diaphragm and the first diaphragm against the surface of the mixture in the form box to compact the mixture; and

means associated with the form box for subsequently introducing a fluid hardening medium between the first and second diaphragms so that it passes through the first diaphragm, penetrates the mixture within the form box, and causes the binder to harden the mixture.

---

**4,129,166**

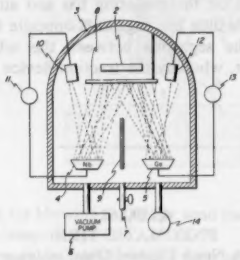
## $NB_3GE$ SUPERCONDUCTIVE FILMS GROWN WITH AIR

**Raymond A. Sigsbee, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Jul. 18, 1977, Ser. No. 816,482**

**Int. Cl.² B23P 3/00; C23C 27/02**

**U.S. Cl. 164—46** **3 Claims**



1. A control method of preparing a superconducting film having a critical temperature $T_c$ of at least about 19° K. which comprises providing a vacuum chamber with a substrate having at least one substantially smooth surface on which said film is to be deposited, said substrate being at least substantially inert under the conditions of deposition, providing said chamber with a source of niobium and germanium, means for monitoring of niobium flux and germanium flux individually, providing said chamber with a source of air, protecting said substrate surface with a movable protective means which prevents niobium and germanium flux from contacting it, reducing the pressure in said chamber to produce an evacuated chamber with a residual pressure no greater than about $10^{-5}$ mm Hg, heating said substrate to a temperature ranging from 750° C. to 1100° C., vaporizing said niobium and germanium to produce an impinging flux composition ranging from about 1 part to about 3 parts of niobium to about 1 part of germanium, allowing said residual pressure to stabilize at a level no greater than about $10^{-5}$ mm Hg, introducing by a controlled leak of air into said evacuated chamber an incremental air pressure which raises said stabilized pressure in said chamber at least about $0.1 \times 10^{-5}$ mm Hg, removing said protective means from said substrate, and impinging said substrate with said niobium and germanium composition forming an adherent superconductive $Nb_3Ge$ film thereon ranging in composition up to about 2 atomic % from stoichiometric composition, for a constant rate of impingement of said niobium and said germanium on said substrate with increasing substrate temperature from 750° C. to 1100° C. said incremental air pressure increasing up to $5 \times 10^{-4}$ mm Hg and said amount of niobium decreasing down to about 1 part, said film having at least a thickness sufficient to form a continuous film.

---

**4,129,167**

## $NB_3GE$ SUPERCONDUCTIVE FILMS GROWN WITH NITROGEN

**Raymond A. Sigsbee, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

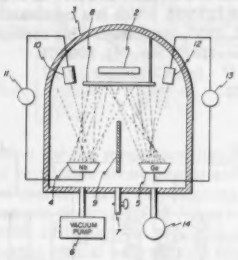
**Filed Jul. 18, 1977, Ser. No. 816,483**

**Int. Cl.² B23P 3/00; C23C 27/02**

**U.S. Cl. 164—46** **3 Claims**

1. A control method of preparing a superconducting film having a critical temperature $T_c$ of at least 17.5° K. which comprises providing a vacuum chamber with a substrate having at least one substantially smooth surface on which said film

is to be deposited, said substrate being at least substantially inert under the conditions of deposition, providing said chamber with a source of niobium and germanium, means for monitoring of niobium flux and germanium flux individually, providing said chamber with a source of nitrogen, protecting said substrate surface with a movable protective means which prevents niobium and germanium flux from contacting it, reducing the pressure in said chamber to produce an evacuated chamber with a residual pressure no greater than about $10^{-5}$ mm Hg, heating said substrate to a temperature ranging from 750° C. to 1100° C., vaporizing said niobium and germanium to produce an impinging flux composition ranging from about 1 part to about 3 parts of niobium to about 1 part of germanium, allowing said residual pressure to stabilize at a level no greater



than about $10^{-5}$ mm Hg, introducing by a controlled leak of nitrogen into said evacuated chamber an incremental nitrogen pressure which raises said stabilized pressure in said chamber at least about $0.1 \times 10^{-5}$ mm Hg, removing said protective means from said substrate, and impinging said substrate with said niobium and germanium composition forming an adherent superconductive $Nb_3Ge$ film thereon ranging in composition up to about 2 atomic % from stoichiometric composition, for a constant rate of impingement of said niobium and said germanium on said substrate with increasing substrate temperature from 750° C. to 1100° C. said incremental nitrogen pressure increasing up to $5 \times 10^{-4}$ mm Hg and said amount of niobium decreasing down to about 1 part, said film having at least a thickness sufficient to form a continuous film.

---

**4,129,168**

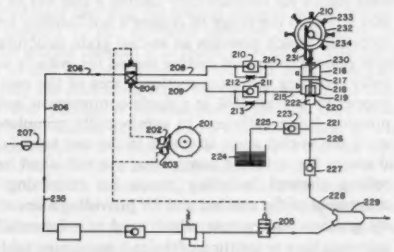
## CATALYST GAS GENERATING CIRCUIT FOR ROTARY CORE MAKING MACHINE

**Anatol Michelson, Sarasota, Fla., assignor to Ashland Oil, Inc., Ashland, Ky.**

**Division of Ser. No. 784,939, Apr. 5, 1977, Pat. No. 4,083,396. This application Jan. 20, 1978, Ser. No. 871,131**

**Int. Cl.[2] B22C *9/14***

**U.S. Cl. 164—159** **2 Claims**



1. Apparatus for supplying predetermined varied quantities of a gaseous curing agent to a rotary core making machine having a plurality of core boxes comprising;

(a) a first cylinder;

(b) a first piston adapted to reciprocate within said first cylinder;

(c) a source of compressed non-reactive gas;

(d) means for controlling the flow of said non-reactive gas from said source to either side of said first piston and for exhausting gas simultaneously from the other side of said piston in synchronization with the rotation of said core making machine, said means being connected to said source of compressed gas and to each end of said first cylinder;

(e) first valve means having an inlet and an outlet each adapted to be controlled electrically;

(f) a second cylinder aligned coaxially with said first cylinder;

(g) a first piston rod connecting at one end to one side of said first piston and extending into the end of said second cylinder;

(h) a second piston adapted to reciprocate within said second cylinder, attached on one side to the other end of said first piston rod and defining with its other side a chamber in said second cylinder;

(i) a rotatable wheel positioned with its axis normal to the axis of said first and second cylinder;

(j) a plurality of stops corresponding in number to said plurality of core boxes mounted radially on the periphery of said wheel, said stops adaptable to be varied in length and adapted to be aligned coaxially with said seond piston rod;

(k) a sprocket wheel attached coaxially to said rotatable wheel;

(l) a second piston rod connected at one end to the other end of said first piston;

(m) a pawl rod fixed to the other end of said second piston rod, extending in the same plane as, and tangentially to, said sprocket wheel and adapted at its free end to engage said sprocket wheel when moved axially toward said first cylinder;

(n) a first conduit connected between the chamber in said second cylinder and a reservoir of liquid catalyst;

(o) a first check valve intermediate the ends of said first conduit;

(p) a vaporizer nozzle;

(q) a second conduit connected at one end to said first conduit intermediate said first check valve and said chamber in said second cylinder and connected at its other end to said vaporizer nozzle;

(r) a third conduit connecting said source of compressed non-reactive gas and the inlet of said first valve means;

(s) and a fourth conduit connecting the outlet of said second valve means and the inlet of said vaporizer nozzle; and

(t) a fifth conduit connecting the outlet of said vaporizer nozzle to said core making machine.

---

**4,129,169**

## APPARATUS FOR MAKING SHELLS FROM THERMOSETTING LIQUID COMPOUNDS

**Roman Biedacha; Wladyslaw Kurdziel; Janusz Kaczor, all of Cracow; Adam Smeder, Wegrzce; Jacek Kolaczkowski, Cracow; Tadeusz Olszowski, Cracow; Adam Nawrocki, Cracow, and Janina Rzeszut, Cracow, all of Poland, assignors to Przedsiebiorstwo Projektowania I Realizacji Inwestycji przemyslu Maszynowego "Bipromasz", Instytut Odlewnictwa, Cracow, Poland**

**Division of Ser. No. 739,535, Nov. 3, 1976. This application Jul. 6, 1977, Ser. No. 813,428**

**Claims priority, application Poland, Nov. 10, 1975, 184620**

**Int. Cl.[2] B22C *13/08***

**U.S. Cl. 164—166** **2 Claims**

1. Apparatus for making shells from liquid thermosetting compounds comprising:

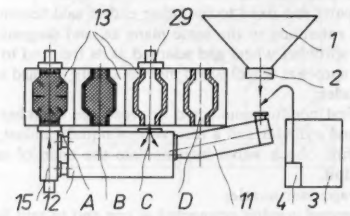
(a) a mould;

(b) a sand container;

(c) a liquid constituent container for a liquid constituent which includes a thermosetting compound;

(d) means operatively coupled with said sand container and said liquid constituent container for forming a molding composition from the sand and the liquid constituent in said containers, said means including a first mixing unit receiving sand and liquid constituent from said containers, a second mixing unit connected with an outlet end of said first mixing unit and arranged to receive excess thermosetting compound from said mould, a sand feeder for feeding sand from said sand container into said mixing unit, and a proportioner unit for proportioning the liquid constituent to be combined with the sand in said first mixing unit, said proportioner unit comprising a movable container body in said liquid constituent container for dispensing a quantity of the liquid constituent into said first mixing unit in response to displacement of said container body, and a fixedly mounted cover having an aperture which communicates with said first mixing unit arranged to cooperate with said container body in dispensing the liquid constituent into said first mixing unit, the liquid constituent being forced through said aperture and into said first mixing unit in response to displacement of said container body towards said cover, and the quantity of the liquid constituent dispensed into said first mixing unit being dependent upon the initial spacing between said container body and said cover; and

(e) a delivery unit positioned for introducing the molding composition into said mould, said delivery unit comprising a housing having a first passage which communicates with said second mixing unit to permit introduction of the molding composition into said housing and a second passage which also communicates with said second mixing unit to permit return of excess molding composition into said second mixing unit, said delivery unit including a conical member interiorly of said housing and a delivery head for the introduction of the casting composition into said mould, said delivery unit further comprising a movable container member having an open end which faces said conical member, said container member being movable from a first position in which said open end is spaced from said conical member to a second position in which said open end abuts said conical member, said container member having a sliding bottom movable from a position adjacent said open end to a position remote therefrom, said delivery unit also comprising a motor unit for displacing said container member and said sliding bottom thereof, a first damper movable between an open position in which said delivery head communicates with said open end of said container member and a closed position in which said delivery head is closed off from said open end of said container member, and a second damper having an open position in which said second passage communicates with said open end of said container member and a closed position in which said second passage is closed off from said open end of said container member, said second damper having a shaft, said delivery unit comprising a cam secured to said shaft, and a biasing element interposed between said cam and said delivery head and operative for biasing said delivery head into engagement with said mould, said container member being filled with the molding composition when said container member is in said first position and said sliding bottom is remote from said open end of said container member, and the molding composition being delivered into said mould via said delivery head by moving said container member to said second position, moving said first damper to said open position thereof and displacing said sliding bottom to a position adjacent said open end of said container member.




---

**4,129,170**

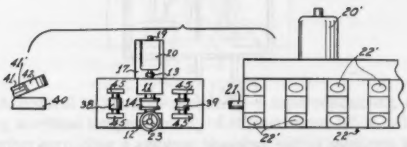
## APPARATUS FOR PRODUCING A HOT-FORMED PRODUCT

**Daniel B. Cofer; George C. Ward, and Dale D. Proctor, all of Carrollton, Ga., assignors to Southwire Company, Carrollton, Ga.**

**Continuation of Ser. No. 323,471, Jan. 15, 1973, abandoned, which is a continuation of Ser. No. 816,127, Apr. 14, 1969, abandoned, which is a division of Ser. No. 390,666, Aug. 19, 1964, Pat. No. 3,317,994, which is a continuation of Ser. No. 613,245, Feb. 1, 1957, abandoned. This application May 24, 1977, Ser. No. 800,070**

**Int. Cl.[2] B22D *11/12***

**U.S. Cl. 164—270** **14 Claims**



**1.** Apparatus for continuously casting and hot-forming a non-homogenized copper bar comprising:

casting means for continuously casting a cast bar of copper that is within the range of copper's hot-forming temperatures and which possesses a columnar dendritic structure,

means remote from said casting means for initially substantially reducing the cross-sectional area of the cast bar of copper by a single compression and of a degree sufficient to substantially completely destroy the columnar dendritic structure in the cast bar of copper,

said means for reducing comprising one roll stand having a substantially elliptical rolling channel for restricting lateral movement of the cast bar and for providing a linear velocity gradient thereacross which tend to substantially prevent cracking or splitting of the cast bar during said reduction, and

hot-forming means for subsequently hot-forming the reduced cross-section cast copper bar while it is still within the range of copper's hot-forming temperatures, said cast bar temperatures having been established in said casting means.

**7.** Apparatus for continuously casting and hot-forming a non-homogenized copper bar comprising:

casting means for continuously casting a cast bar of copper that is within the range of copper's hot-forming temperatures and which posseses an as-cast grain structure,

means remote from said casting means for initially substantially reducing the cross-sectional area of the cast bar of copper by at least 36% in a single compression, said compression being sufficient to substantially completely destroy the as-cast grain structure in the cast bar of copper,

said means for reducing comprising one roll stand having a rolling channel including means for restricting lateral movement of the cast bar and for providing a linear velocity gradient thereacross which tend to substantially prevent cracking or splitting of the cast bar during said reduction, and

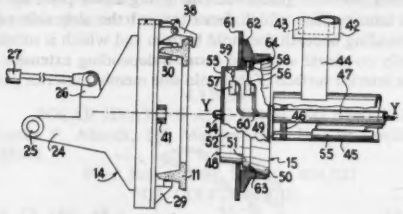
hot-forming means for subsequently hot-forming the reduced cross-section cast copper bar while it is still within the range of copper's hot-forming temperatures, said cast bar temperatures having been established in said casting means.

4,129,171

## INSTALLATION FOR HANDLING SOCKET CORES FOR A CENTRIFUGAL CASTING MACHINE

Michel Pierrel, and Roger Malivoir, both of Pont-a-Mousson, France, assignors to Pont-a-Mousson S.A., Nancy, France

Continuation of Ser. No. 689,412, May 24, 1976, abandoned.
This application Nov. 14, 1977, Ser. No. 851,318
Claims priority, application France, Jun. 27, 1975, 75 20238
Int. Cl.[2] B22D *13/00, 33/04*
U.S. Cl. 164—292 20 Claims



1. An installation for the mechanical handling of a socket core which is of revolution about an axis and intended to be fixed in a socket end of a centrifugal casting mold which is rotatable about an axis, the installation comprising, in combination with said mold, a first support having an axis for carrying the core in a position coaxial with the first support and pivotable about a fixed pivot axis between a horizontal first position in which first position the axis of the first support is vertical and a vertical second position in which second position the axis of the first support is horizontal, means for positioning the core coaxially with the first support in said horizontal first position of the first support and releasable means for maintaining the core on the first support in said coaxial position, mechanical core carrying means for conveying the core along from a core producing station to the first support and placing the core on the first support to engage said means for positioning the core, annular core-backing means for mounting on the socket end of the mold and retaining the core in position on the socket end during casting, releasable holding means combined with the socket end of the mold for engagement with and holding the core-backing means on the socket end during casting, transferring means for combining the core and the core-backing means and transferring the core combined with the core-backing means from the first support to the socket end of the mold for mounting the core and core-backing means on the socket end by the action of said holding means and leaving the core-backing means on the socket end during casting, returning to the core-backing means after casting and transferring the core-backing means to a position for receiving a new core alone from the first support, said transferring means consisting essentially of a second support having a horizontal axis for supporting the core and the core-backing means in a removable manner in positions substantially coaxial with the second support, means guidingly carrying the second support and allowing the second support to the movable between a first position in which the second support is adjacent and coaxial with the first support in said second position of the first support to permit transferring the core alone from the first support to the second support and putting it in abutment with the core-backing means on the second support and a second position in which the second support is adjacent said socket end and the axis of the second support is in axial alignment with said axis of rotation of the mold for transferring the core and the core-backing means to said socket end, first releasable gripping means carried by the second support for retaining the core on said second support and second releasable gripping means carried by the second support for retaining the core-backing means on the second support during the movement of the second support between said first and second positions of the second support, the two supports being provided with interengageable centering means operative independently of the core in said first position of the second support and said second position of the first support, said means carrying the second support allowing the second support to be movable transversely of said axis of rotation of the mold.

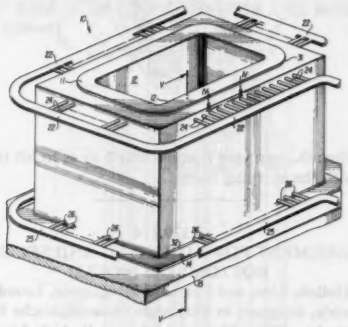
---

4,129,172

## MOLD FOR ELECTROSLAG REMELTING PROCESS

William F. Snee, Jr., Coatesville, Pa., assignor to Lukens Steel Company, Coatesville, Pa.

Filed Oct. 27, 1976, Ser. No. 736,239
Int. Cl.[2] B22D *27/04, 11/124*
U.S. Cl. 164—348 13 Claims



1. A monolithic mold for use in the electroslag remelting process, the mold comprising a copper liner having walls for forming an ingot of substantially uniform chemistry and physical characteristics throughout, said walls having planar-shaped inboard surfaces and vertical heat exchanging conduits provided along their outboard surfaces, said vertical conduits being defined by spaced ribs for substantially the vertical height of said walls, said ribs having a width of 1.5 to 6.0 times the width of the adjacent said conduit, fluid intake and discharge means operatively associated with said conduits to provide a vertical disposed flow of cooling fluid through said conduits, the spacing of the ribs together with their thickness and depth being such whereby a substantial portion of each said rib is maintained at a sufficiently low temperature by said cooling fluid to sustain the rigidity of said liner and to prevent substantial distortion from taking place by said walls during the electroslag refining process.

---

4,129,173

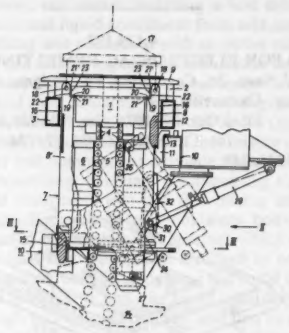
## CONTINUOUS CASTING PLANT

Werner Scheurecker, Linz, and Reinhard Hargassner, Leonding, both of Austria, assignors to Vereinigte Osterreichische Eisen-und Stahlwerke - Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Jun. 24, 1977, Ser. No. 809,693
Claims priority, application Austria, Jul. 8, 1976, 4999/76
Int. Cl.[2] B22D *11/14*
U.S. Cl. 164—442 7 Claims

1. In a continuous casting plant of the type including a frame-shaped lifting table, a mould insertable in said lifting table and reciprocated by said lifting table, a strand guide means comprised of strand guide parts following the mould in the extraction direction and a carrying frame surrounding the strand guide part following the mould for removing the strand guide part from the plant, the improvement which is characterized in that the carrying frame, the strand guide part following the mould and the mould as a unit are installable in and removable from the continuous casting plant independent of the lifting table because said carrying frame is arranged with play within said frame-shaped lifting table and is vertically movable through the frame-shaped lifting table together with said strand guide part following the mould, and supporting faces

are provided on said mould and on said carrying frame opposite each other with play, which supporting faces engage each



other when the carrying frame is lifted so as to lift the mould along with the carrying frame.

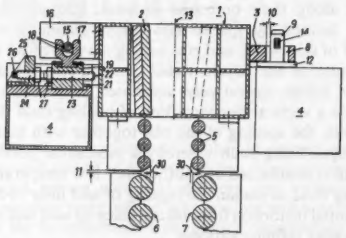
---

**4,129,174**

## ARRANGEMENT FOR ADJUSTING AND SECURING A BOTTOMLESS MOULD

**Günter Holleis, Linz, and Reinhard Hargassner, Leonding, both of Austria, assignors to Vereinigte Österreichische Eisen-und Stahlwerke - Alpine Montan Aktiengesellschaft, Linz, Austria**

**Filed Jan. 7, 1977, Ser. No. 757,461**
**Claims priority, application Austria, Jan. 16, 1976, 265/76**
**Int. Cl.[2] B22D** *11/124, 11/00*
**U.S. Cl. 164—443** **16 Claims**



1. In an arrangement for adjusting and securing a bottomless mould, including a water box, on a mould lifting table in a continuous casting plant for strand including supporting and guiding paths arranged to follow said mould to support the strand at opposite sides thereof, and sets of interacting centering means provided on the mould lifting table and on the mould for centering them with respect to each other, the improvement comprising:

displacement means for displacing one centering means of each set in a straight line direction perpendicular to the supporting and guiding paths so as to displace the mould perpendicular to the supporting and guiding path;

mounting means for mounting the mould with lateral play relative to the mould lifting table; and

bracing means for fixing the mould on the mould lifting table.

---

**4,129,175**

## CONTINUOUS SLAB CASTING MOLD

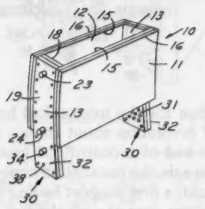
**Floyd R. Gladwin, 21000 E. River Rd., Grosse Ile, Mich. 48138**

**Filed Aug. 1, 1977, Ser. No. 820,462**
**Int. Cl.[2] B22D** *11/124, 27/04*
**U.S. Cl. 164—444** **4 Claims**

1. In a continuous slab casting mold formed of a pair of spaced apart mold front and rear plate members and a pair of mold side plate members secured together to form an open top and bottom, roughly rectangular shaped in cross-section, mold for receiving molten metal through the open top and continuously casting metal slab through the mold and downwardly out through the open bottom thereof, and each of said mold side plate members including an interior plate for contacting and molding the metal slab side edges, and an exterior backing plate for the interior plate, the improvement comprising:

an extension plate formed on the lower edge of and depending downwardly a considerable distance from each of the side plate members;

and said extension plates each including a face plate having an interior face which faces toward the slab side edge extending beneath the mold bottom and which is substantially co-planar with and forms a depending extension of the interior surface of the mold side member interior plate;



and said extension plates each including an exterior back plate secured to and backing its respective face plate;

a hollow chamber within each of said extension plates and formed by a hollowed out portion in the backing plate which is covered by its respective face plate, and holes communicating said chamber with said interior surface, and a cooling fluid inlet connected to said hollow chamber for continuously flowing coolant through the chamber and holes to the adjacent slab edge surface;

and including a horizontal groove near the bottom edge of the mold extending the width of and formed in the interior surface of each extension plate for forming a barrier against coolant rising upwardly into the mold from the extension plates.

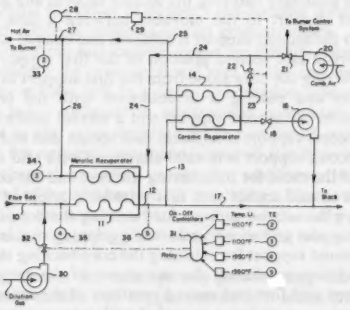
---

**4,129,176**

## HEAT RECOVERY SYSTEMS

**Fred M. Heyn, Export; Ching-Feng Yin, Pittsburgh; Gordon L. Hanson, Bethel Park, and Robert C. Schreck, Monroeville, all of Pa., assignors to Thermal Transfer, division of Kleinewefers, Monroeville, Pa.**

**Filed Jun. 9, 1977, Ser. No. 805,187**
**Int. Cl.[2] F28F** *27/02*
**U.S. Cl. 165—7** **8 Claims**



1. A heat recovery system comprising a flue gas conduit

receiving hot flue gas from a furnace or the like, a metallic recuperator having means for receiving hot flue gas from said flue gas conduit, a ceramic regenerator having means for selectively receiving at least a part of the hot flue gas leaving the metallic recuperator, by-pass means in parallel with the ceramic regenerator receiving any of the flue gas leaving the metallic recuperator which does not go through the ceramic regenerator, stack means receiving the flue gas from the by-pass means and the ceramic regenerator means for discharge to the atmosphere, means delivering air to be heated in parallel to the ceramic regenerator and the metallic recuperator, and conduit means receiving and combining heated air from the ceramic regenerator and the metallic for delivery to a point of use.

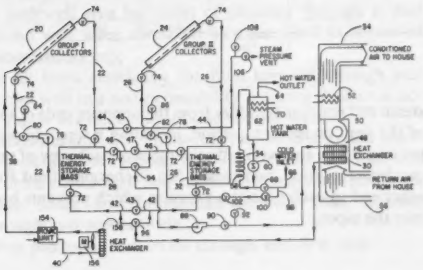
---

**4,129,177**

## SOLAR HEATING AND COOLING SYSTEM

**Thomas P. Adcock, 300 Meadowbrook Dr., Huntsville, Ala. 35803**

**Filed Jun. 6, 1977, Ser. No. 804,022**
**Int. Cl.[2] F25B *29/00***
**U.S. Cl. 165—48 S** **12 Claims**




1. A solar heating and cooling system comprising:

a. a primary piping system for containing and pumping a primary heat exchange media, the system including a first piping network and a first pump therefor, a second piping network and a second pump therefor, and first valve means for selectively interconnecting said first and second piping networks;

b. a first primary heat exchanger in heat exchange relationship with the primary media transmitted through said first piping network;

c. a second primary heat exchanger in heat exchange relationship with the primary media transmitted through said second piping network;

d. a first media storage reservoir connected to said first piping network and isolatable from said second piping network;

e. a second media storage reservoir connected to said second piping network and isolatable from said first piping network;

f. a first solar heat collector means thermally coupled in heat exchange relationship to said first piping network such that heat from the sum can be transferred to the primary media therein;

g. a cooling subsystem for chilling a secondary media, said cooling subsystem including a cooling unit for cooling the secondary media, a secondary piping system connected to said cooling unit, a secondary heat exchanger having a primary section connectable to said first piping network and a secondary section in heat exchange relationship to said secondary piping system, and means for causing the secondary coolant to flow through said second piping system from said cooling unit to and through said secondary section of said heat exchanger; and

h. a second solar heat collector means thermally coupled in heat exchange relationship to said second piping network such that heat from the sun can be transferred to the primary media therein.

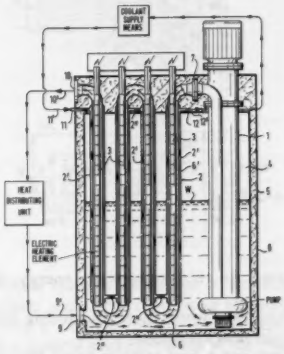
---

**4,129,178**

## HEAT EXCHANGE INSTALLATION FOR HEATING AND COOLING A LIQUID HEAT CARRIER MEDIUM

**Hans Hucke, Essigweg 6, CH-4133, Pratteln-Basel, Switzerland**

**Filed Jul. 19, 1976, Ser. No. 706,841**
**Claims priority, application Fed. Rep. of Germany, Jul. 23, 1975, 2532978**
**Int. Cl.[2] F25B *29/00*; F28D *15/00*; H05B *3/82*; B67D *5/62***
**U.S. Cl. 165—61** **5 Claims**

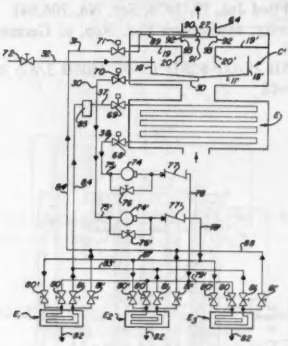



1. A heat transfer arrangement for heating and cooling a liquid heat carrier medium comprising: a tank for receiving a quantity of liquid heat carrier medium, said tank having an intake and outlet; a plurality of straight parallel pipes within said tank; said pipes being connected in series; said series-connected pipes forming a flow path for said heat carrier medium; heating means within each of said straight pipes in spaced relation to the inner surface thereof for supplying heat to said heat carrier medium; cooling means including a cooling jacket substantially surrounding each of said straight pipes for circulating a cooling medium in heat exchange relation with the exterior surface of the pipe; circulating pump means having an inlet and a pressure outlet; said series-connected pipes having an intake end connected to said pressure outlet of said pump means; said tank outlet being connected to the other end of said series-connected pipes, said other end being an outlet end of said series-connected pipes; said pump means comprising an immersion pump and being located together with said series-connected pipes in said tank; said pump means inlet being located in a lower portion of said tank for receiving said liquid heat carrier medium therefrom; said tank being partially filled with said heat storage medium to a level above said pump means inlet and serving as a collector of heat carrier medium entering said tank through said intake of said tank; said tank also serving as an expansion tank for pressure differences arising in said pipes; said heat carrier medium being delivered to a heat distributing unit through said outlet of said tank; said heat carrier medium being returned to said tank from the heat distributing unit through said intake of said tank, the arrangement of said heating means within and said cooling jacket around each of said straight pipes being such that said heat carrier medium and said cooling medium flow in separate flow-through spaces, said flow-through spaces being shaped for predetermined flow conditions so that said heat carrier medium flows at substantially uniform speed in a relatively thin layer on walls of said pipes for predetermined transfer of heat from or to said heat carrier medium.

## 4,129,179
## APPARATUS FOR UTILIZATION OF WASTE ENERGY

Victor D. Molitor, Denver, Colo., assignor to Stainless Equipment Company, Englewood, Colo.

Continuation-in-part of Ser. No. 647,205, Jan. 7, 1976, abandoned, and a continuation-in-part of Ser. No. 789,938, Apr. 22, 1977, which is a continuation-in-part of Ser. No. 647,205,. This application Nov. 21, 1977, Ser. No. 853,571
Int. Cl.[2] F23J *11/00*; F24C *15/20*; F25B *29/00*; F28F *27/02*
U.S. Cl. 165—101 17 Claims



1. In apparatus for recovering waste energy, the combination of:

a gaseous source of waste energy, including heat;

a gas to liquid heat exchanger;

means for moving a heat transfer liquid through said heat exchanger to heat said liquid;

means for causing the gas from said gaseous source of waste energy to pass through said heat exchanger to heat said heat transfer liquid;

heat exchange means, including a path for a heated or chilled liquid to heat or cool, alternatively, makeup air for a room and the like;

means for passing makeup air through said heat exchange means;

means for circulating said heated heat transfer liquid through said heat exchange means;

a chiller having walls and baffle means for directing air toward a water bath for agitating the bath and producing evaporation of water for cooling said water and said air;

means for supplying water to said chiller to form a water bath;

means for flowing said waste energy gas through said chiller from said heat exchanger for agitating said water bath to chill said water; and

means for alternatively circulating said chilled water from said chiller through said heat exchange means.

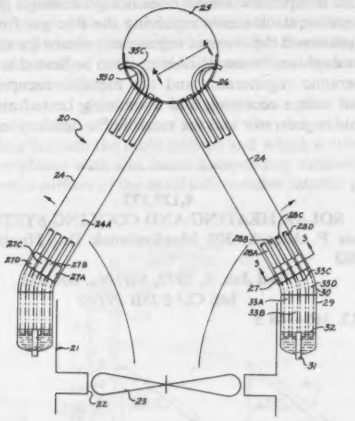
---

## 4,129,180
## VAPOR CONDENSING APPARATUS

Michael W. Larinoff, Houston, Tex., assignor to Hudson Products Corporation, Houston, Tex.

Filed Dec. 6, 1976, Ser. No. 747,808
Int. Cl.[2] F28B *9/10*
U.S. Cl. 165—113 29 Claims

1. Apparatus for condensing steam or other vapor which contain non-condensibles such as air at a pressure near or below atmospheric, comprising a condenser having a main portion including a pair of parallel rows of tubes over which air is caused to pass successively, an inlet header for introducing steam into one end of the tubes of the main condenser portion, a vent portion having a pair of parallel rows of tubes over which air is caused to pass successively, one end of the tubes of the vent condenser portion being connected to the opposite ends of the tubes of the main condenser portion so as to receive uncondensed steam and non-condensibles therefrom, an outlet header including a pair of sections each connecting with the tubes of only one row of the vent condenser portion, means for draining condensate from the outlet header while isolating the pressure within each section thereof from that within the other, and means for removing uncondensed



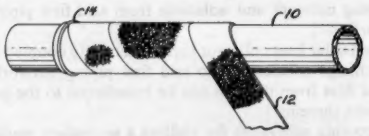
steam and non-condensibles from the opposite ends of the tubes of the vent condenser portion, including a separate pipe connecting at one end with only the tubes of each row of said vent condenser portion, and means for discharging fluid from the other end of each pipe at a pressure which prevents backflow into the pipes.

---

## 4,129,181
## HEAT TRANSFER SURFACE

Kenneth R. Janowski, Wheaton; Ming S. Shum, Des Plaines, and Steven A. Bradley, Northbrook, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Feb. 16, 1977, Ser. No. 769,623
Int. Cl.[2] F28F *13/02*
U.S. Cl. 165—133 5 Claims

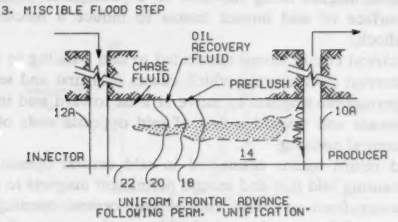


1. A metal heat transfer member having at least one nucleate boiling surface which is adapted to be exposed to a boiling medium, said at least one surface being coated with a layer of a non-particulate reticulated metal structure which is in intimately bonded thermally conducting relationship to said at least one surface, said reticulated metal structure being shell-like and skeletal with all the metal therein surrounding a complementary reticulated non-metallic core portion contained within said layer.

## 4,129,182
## MISCIBLE DRIVE IN HETEROGENEOUS RESERVOIRS

Mahmoud K. Dabbous, Tulsa, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Feb. 28, 1977, Ser. No. 772,888
Int. Cl.[2] E21B *33/138, 43/22*
U.S. Cl. 166—263 1 Claim

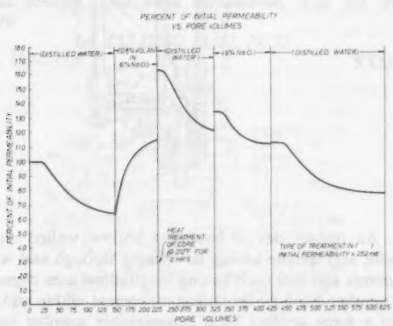



1. A method of recovering oil from an underground reservoir in which a first well has been drilled which comprises:
(a) drilling a second well into said underground reservoir;
(b) injecting a permeability-reducing foam through said first well into said reservoir in sufficient quatity to extend into an interwell area but short of breaking through at said second well when displaced by chase fluid to improved volumetric sweep;
(c) at all times restricting the fluid injected through said second well to a non-permeability reducing fluid so as not to impair the injectivity of said second well;
(d) thereafter injecting an oil recovery fluid into said reservoir through said second well spaced from said first well to drive oil through said reservoir toward said first well, there being no permeability-reducing fluid injected through said second well;
(e) then producing driven oil through said first well.

## 4,129,183
## USE OF ORGANIC ACID CHROME COMPLEXES TO TREAT CLAY CONTAINING FORMATIONS

George Kalfoglou, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Jun. 30, 1977, Ser. No. 811,804
Int. Cl.[2] E21B *43/22, 43/24*
U.S. Cl. 166—300 7 Claims

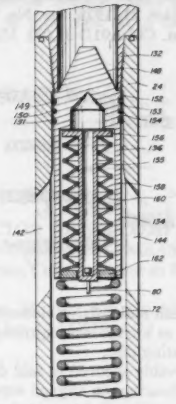



1. A method of treating a subterranean formation containing hydratable clay to stabilize said formation against clay-swelling and particle migration comprising:
contacting said clay within the formation with an aqueous solution of a chrome complex of the Werner-type in which trivalent chromium atoms are coordinated with a carboxylic acido ligand having a hydrocarbon radical containing two to eight carbon atoms to form a polynucleated chrome complex on the surface of the clay particles.

## 4,129,184
## DOWNHOLE VALVE WHICH MAY BE INSTALLED OR REMOVED BY A WIRELINE RUNNING TOOL

William H. Parker, Hurst, Tex., assignor to Del Norte Technology, Inc., Euless, Tex.

Filed Jun. 27, 1977, Ser. No. 810,201
Int. Cl.[2] E21B *43/12*
U.S. Cl. 166—315 23 Claims

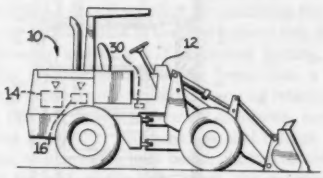


1. A downhole valve which is free of wireline connections with the surface, said valve comprising an elongated unitary housing having a wireline running tool connector means at one end and a control package means at the other end, valve means near the center of the housing mounted for undertaking an excursion in a first direction to an open position at a discrete distance within said housing, spring means for normally urging said valve to move in an opposite direction over said discrete distance to a closed position, and means controlled by said control package means responsive to signals transmitted downhole for moving said valve in said first direction against the urging of said spring means and over said discrete distance to said open position, said valve thereafter remaining in said open position without requiring a continuous energy drain at said valve.

## 4,129,185
## FIRE SUPPRESSION SYSTEM

Roland E. Hasselbacher, Brimfield, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 15, 1977, Ser. No. 815,954
Int. Cl.[2] A62C *3/00*
U.S. Cl. 169—62 9 Claims




9. A fire suppression system for a machine having an engine with a governor comprising:
a source of pressurized fire extinguishing fluid;
means for controllably directing said fluid to preselected areas of said machine;
means for controllably releasing said fluid; and
means for automatically stopping said machine in response to controlled release of said fluid and maintaining said machine stopped, said machine remaining stopped until said fire suppression system is readied for operation;

said stopping means including a solenoid operably connected to the governor, said solenoid being energized in response to the closing of a pressurized switch which closes in response to controlled release to the fluid and controllably manipulating the governor to stop the engine and machine.

---

**4,129,186**

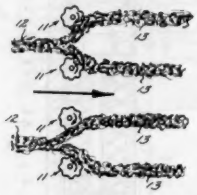
**BEAN PULLER**

**Dorwin J. Sheathelm, 1336 Dietz Rd., Dansville, Mich. 48819**

**Filed Oct. 21, 1976, Ser. No. 734,733**

**Int. Cl.[2] A01D** *31/00, 55/00*

**U.S. Cl. 171—83** **8 Claims**



1. A powered bean puller drive element for propulsion by a prime mover such as a tractor comprising:

a horizontal rotating disc;

a drive shaft drivably secured to said disc;

top and bottom bearings in aligned support of said shaft;

a motor drivably connected to said shaft;

an elongate drive frame supporting said motor, said bearings and said shaft and for selectively tilting said disc, said drive frame is movable vertically in a parallelogram inner box frame and an outer parallelogram box frame, each having four pivot points and each having one side in fixed relatively vertical relation;

a gage wheel adjustably supported by said drive frame and vertically establishing the running depth of said horizontal disc; and

framing means connectable to a prime mover and independent of said gage wheel and connected to said drive frame for elevation of said drive frame and disc.

---

**4,129,187**

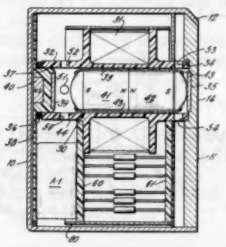
**ELECTRO-MECHANICAL VIBRATOR**

**Michael Wengryn, Nashua, and Alexander Khazan, Manchester, both of N.H., assignors to Sun Chemical Corporation, New York, N.Y.**

**Filed Dec. 27, 1977, Ser. No. 864,273**

**Int. Cl.[2] B25D** *9/00*

**U.S. Cl. 173—117** **11 Claims**



1. An electro-mechanical vibrator for decreasing the friction of a mechanical movement comprising, in combination:

a non-magnetic support spool having a central axial opening;

a winding wound around said spool;

first and second permanent magnets disposed within said central axial opening and being closely fitted within said opening to be freely movable therein and being guided by said central opening, said first and second permanent magnets being permanently magnetized in the direction of the axis of said central axial opening and being held together with like poles facing one another;

said central axial opening having an axial length which is greater than the combined axial length of said first and second permanent magnets;

impact means disposed at at least one of the opposite ends of said central axial opening, the free end of said first permanent magnet being movable to a position to strike the surface of said impact means to induce a mechanical shock;

electrical circuit means connected to said winding to cause current flow therein which causes said first and second permanent magnets to move at least toward said impact means and toward a first of said opposite ends of said central opening;

and return means connected in said central opening for causing said first and second permanent magnets to move away from said first end of said central opening and toward the opposite end of said central opening, after said first permanent magnet strikes said impact means.

---

**4,129,188**

**IMPACT DEVICE FOR MARKING, PUNCHING, STAMPING, FORMING, RIVETING AND OTHER RELATED OPERATIONS**

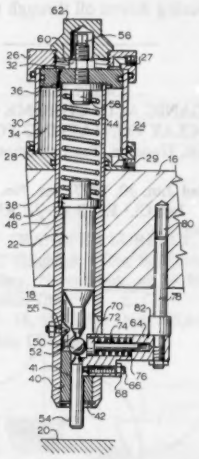
**Monti El-Souéssi, 632 Stoops Ferry Rd., Coraopolis, Pa. 15108; Gilbert Laffay, II Rue des Glycines, Meyzieu, Rhone, France, and Jean-Christian Neuschwander, 34 Rue de la Claire, Lyon 9éme, Rhone, France**

**Filed Mar. 7, 1977, Ser. No. 775,382**

**Claims priority, application France, Mar. 10, 1976, 76 07589**

**Int. Cl.[2] B25D** *9/00*

**U.S. Cl. 173—120** **8 Claims**



1. An impact device having a hollow walled elongated spindle, said spindle having an opening through said wall, and a hammer and tool each having longitudinal axes aligned with one another disposed for sliding movement within said spindle upon a force applied by a compressible member and axial motion of said spindle, comprising:

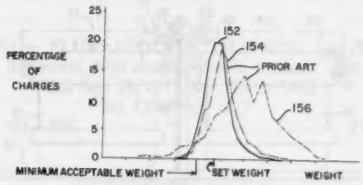
a. a spherical member positionable between the ends of said hammer and tool along said aligned axes and ejectable from said position upon pressure applied to said member by said hammer and tool; and

b. a receptable disposed through said opening in said spindle wall, moveable with respect to said spindle, having means for receiving and subsequently discharging said spherical member upon said ejectment of said spherical member.

## 4,129,189
## WEIGHT CONTROL SYSTEM

Steve C. Maglecic, 620 Ash, Walla Walla, Wash. 99362, and Larry W. Oberholtzer, Walla Walla, Wash., assignors to Steve C. Maglecic, Walla Walla, Wash.

Filed May 7, 1976, Ser. No. 684,255
Int. Cl.[2] G01G 13/02, 3/14
U.S. Cl. 177—123 26 Claims



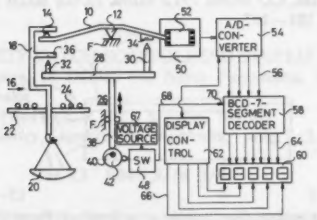

1. A weight control system for a bulk-dribble packaging machine wherein individual charges of product are successively accumulated for packaging at a substantially constant bulk flow rate and, upon cessation of bulk flow, at a substantially constant dribble flow rate until a total charge weight approximating a desired set weight is accumulated, which system comprises: bulk weight adjusting means, responsive to the time taken during dribble flow to accumulate sufficient product to complete a charge, for controlling shut-off of bulk flow to increase or decrease the bulk weight of product accumulated for a subsequent charge at the bulk flow rate when dribble flow time was, respectively, greater or less than a predetermined period for the charge completed; and dribble weight adjusting means, responsive to the total static charge weight of product accumulated, for controlling shut-off of dribble flow to increase or decrease the dribble weight of product accumulated for a subsequent charge at the dribble flow rate when the total static charge weight of the charge completed was, respectively, less or greater than the desired set weight.

---

## 4,129,190
## WEIGHING APPARATUS INCLUDING DISPLAY CONTROL MEANS

Hanspeter Lechner, Wetzikon, Switzerland, assignor to Mettler Instrumente AG, Greifensee, Switzerland

Filed Aug. 3, 1977, Ser. No. 821,417
Claims priority, application Switzerland, Aug. 19, 1976, 10556/76
Int. Cl.[2] G01G 23/02, 19/52
U.S. Cl. 177—155 5 Claims




1. Weighing apparatus for measuring the mass of a load, comprising

(a) a scale frame (F);

(b) a weighing assembly (10, 16) connected with said frame for movement between no-load and load-responsive positions;

(c) weighing assembly arresting means (26) connected with said frame for movement between arresting and non-arresting positions relative to said weighing assembly, respectively;

(d) multi-segment display means (60) for displaying weight indicia corresponding to the mass of a load applied to said weighing assembly, said display means including normally deactivated means (70, 59) for illuminating all of the segments of said display means; and

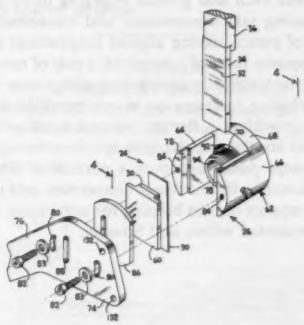
(e) operating means for displacing said arresting means to a given position and for simultaneously activating said illuminating means to illuminate all of the segments of the display means.

---

## 4,129,191
## OPTICAL DETECTOR WHICH COMPENSATES FOR NONLINEARITIES IN A WEIGHT MEASURING SYSTEM

L. Neil Kanning, Darien, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Sep. 26, 1977, Ser. No. 836,744
Int. Cl.[2] G01G 3/14
U.S. Cl. 177—210 R 14 Claims



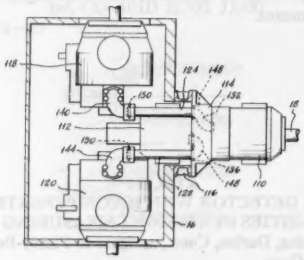
1. A weight measuring system adapted to indicate the weight of an article, the system comprising a spring scale, the scale including a frame link and a load support link, a scale assembly linkage interconnecting the frame link and the load support link, means providing displacement of the load support link with respect to the frame link in proportion to the weight of the article, the scale assembly linkage causing the load support link to deflect along a path having components other than in a vertical direction, an optical detector for indicating the weight of the article by measurement of the load support link displacement, the detector including a first optical grating, means fixing the first grating relative to the frame link, a second optical grating, means fixing the second grating relative to the load support link for unitary movement therewith, each grating comprising a plurality of spaced parallel rulings, a light source adapted to generate a light beam, photodetector means positioned at the end of the light beam, the gratings being positioned between the light source and the photodetector means so as to modulate the light beam, movement of the load support link in response to the weight of the article causing the second grating to move with respect to the first grating and modulating the light beam to provide a cyclic optical signal indicative of the load support link displacement, and compensation means operatively associated with the gratings for optically compensating the cyclic optical signal to provide correction for the other than vertical components of the load support link deflection.

4,129,192

## HYDROSTATIC TRANSMISSIONS

Eugenio Todeschini, Latina, and Gian P. Riganti, Anzio, both of Italy, assignors to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed May 17, 1977, Ser. No. 797,727
Claims priority, application United Kingdom, May 20, 1976, 20825/76
Int. Cl.[2] B62D *11/04*
U.S. Cl. 180—6.48 3 Claims



1. A vehicle having a pair of ground engaging drive means, a prime mover, a hydrostatic transmission interconnecting said prime mover and each said ground engaging drive means, a housing supporting said transmission, said transmission comprising a pair of pumps having aligned longitudinal axes and mounted on opposite faces of a manifold, a pair of motors, and conduit means hydraulically connecting said pumps and said motors and including passageways in said manifold, a face on said manifold providing a flange connection mounting said manifold on said housing which has an aperture through which one of said pumps passes and over a portion of which said manifold face overlaps for the flange connection, said manifold providing the support on said housing for said pumps and said motors being mounted within said housing.

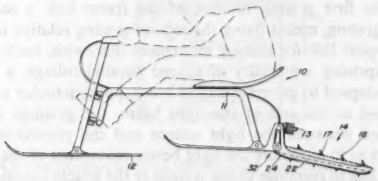
---

4,129,193

## PROPULSION SYSTEM FOR A SNOW GOING DEVICE

Royce H. Husted, Wheaton, Ill., assignor to Saroy Engineering, Wheaton, Ill.

Filed May 4, 1977, Ser. No. 793,728
Int. Cl.[2] B62M *27/00*
U.S. Cl. 180—5 R 6 Claims



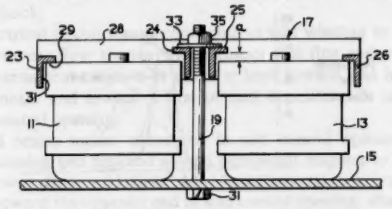
1. A propulsion system for a snow going device, comprising in combination a propulsion tread circulateably supported around an elongated body, and skirt means, on each side and extending below side elongated body, said skirt means adapted to serve as protective rails for said tread and for slidingly supporting said propulsion system over hard terrain.

4,129,194

## HOLD-DOWN DEVICE FOR STORAGE BATTERIES

Howard A. Hammond, Alexander, and John F. Sardina, Williamsville, both of N.Y., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jul. 28, 1977, Ser. No. 819,743
Int. Cl.[2] B60R *18/02*
U.S. Cl. 180—68.5 6 Claims



1. A hold-down device for use with a pair of storage batteries supported in juxtaposed position on a base, including a frame, said frame comprising a first hold-down member engageable with an outside top edge of one of said juxtaposed batteries, a second hold-down member engageable with an inside top edge of said one battery, a third hold-down member engageable with the adjacent inside top edge of the other of said juxtaposed batteries, a fourth hold-down member engageable with an outside top edge of said other battery, and first and second substantially parallel end members attached to and connecting the ends of said first, second, third and fourth hold-down members; and fastener means engageable with said frame and with said base to apply a clamping force on said batteries between said frame and said base; the improvement wherein said second and third hold-down members are attached to said end members offset upwardly in relation to said first and fourth hold-down members, whereby said second and third hold-down members will remain out of contact with the inner top edges of said juxtaposed batteries when less than a predetermined clamping force is applied by said fastener means.

---

4,129,195

## DIAPHRAGM FOR SPEAKER

Yasuhiro Ishii; Shintaro Hirose, both of Gifu, and Ryoichi Kawasaki, Sakai, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi and Tokyo Sanyo Electric Co., Ltd., Gunma, both of, Japan

Continuation-in-part of Ser. No. 752,480, Dec. 20, 1976. This application Oct. 25, 1977, Ser. No. 844,904
Claims priority, application Japan, Dec. 24, 1975, 50-155394
Int. Cl.[2] H04R *7/12*; G10K *13/00*; B32B *3/10*
U.S. Cl. 181—167 10 Claims

7. A speaker diaphragm in a laminar form comprising a three-dimensional mesh-structured porous metal made of a heavy metal selected from the group consisting of nickel, iron or copper, and a layer of air-impermeable material applied to a surface of said porous metal to block the pores of said porous metal to air flow and to increase the rigidity of said porous metal.

9. A speaker diaphragm as set forth in claim 7, wherein said porous metal is produced by a method comprising the step of preparing defilmed foam urethane, the step of plating the foam

urethane with said heavy metal and the step of removing the foam urethane by heat treatment.

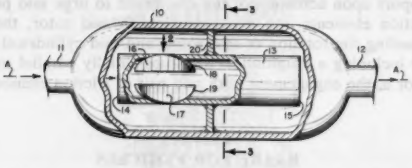
---

**4,129,196**

## FLUID ACOUSTIC SILENCER

**Wilhelm S. Everett, 3098 Solimar Beach, Ventura, Calif. 93001**

**Filed Sep. 29, 1977, Ser. No. 837,812**
**Int. Cl.[2] F01N *1/12***
**U.S. Cl. 181—280** **7 Claims**



3. A fluid acoustic silencer including, in combination:
(a) an outer casing having inlet and outlet openings;
(b) a cylindrical tube having an inlet port and an outlet port, at least a major portion of said tube including its inlet port being supported within said casing; and
(c) vane means consisting solely of first and second vanes in the form of flat plates having arcuate edges secured to diametrically opposite internal wall portions of said tube, said edges extending in like axial directions and opposite circumferential directions to define segments of a spiral, the circumferential extent of each vane being no greater than 180° and the plane of each vane forming an acute angle with the axis of said tube of from 30° to 45°, the remaining portion of said tube beyond said plates to said outlet port being free of all obstructions whereby fluid passing into the inlet opening of said casing also passes through said inlet port and out said outlet port, said first and second vanes imparting a rotational component to the fluid flow through said tube.

---

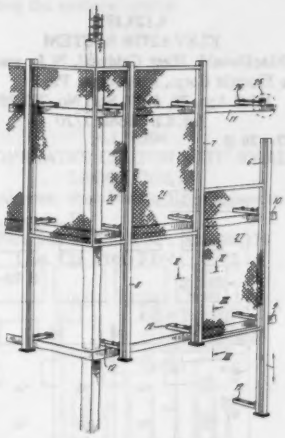
**4,129,197**

## SAFETY-CATCH SCAFFOLDING SYSTEM

**John C. Preston, 18 Dunlop St., North Parramatta, N.S.W., 2151, Australia**

**Filed Feb. 3, 1977, Ser. No. 765,391**
**Claims priority, application Australia, Aug. 13, 1975, 16852/75**
**Int. Cl.[2] E04G *3/14, 5/04***
**U.S. Cl. 182—82** **7 Claims**

1. A scaffolding system comprising, in combination, a plurality of frames, a series of spaced upright standards each having a plurality of vertically disposed slots or open faces therein communicating with the interior of the standard, two such outwardly and oppositely directed slots in each said standard being adapted for the sliding engagement therein of the edges of said frames which extend between the standards, and a third such slot being adapted for the sliding engagement therein of fastening means near the end of a cantilever protruding beyond the edge of a floor slab of a building to be protected by the interposing of said frames in the spaces between adjacent standards, so as to extend above and beyond a formed floor, quick



detachable means connecting said frames to said standards at vertically spaced intervals.

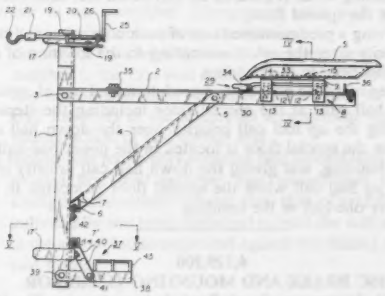
---

**4,129,198**

## POLE SEAT AND LADDER

**Alex E. Hunter, 817 Chartiers Ave., Pittsburgh, Pa. 15220**

**Filed Aug. 31, 1977, Ser. No. 829,263**
**Int. Cl.[2] A47C *9/10***
**U.S. Cl. 182—187** **2 Claims**

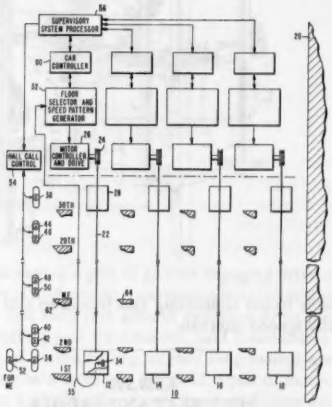


1. A collapsible seat assembly for mounting on a pole comprising an upright post, a horizontal frame having one end pivotally connected to the post, a brace having one end pivotally connected to said horizontal frame and the other end detachably connected to said post, a seat mounted on a carriage which is movable on said horizontal frame, said carriage comprising inverted U-shaped members having depending legs forming pivotal supports for axles and inwardly extending pins at the lower extremities of said inverted U-shaped members for engagement with the undersurface of said horizontal frame to prevent lateral or upward movement of the carriage, a connecting element rigidly secured to said axles, attaching means for selectively attaching said carriage to different longitudinal positions, said attaching means comprising a latch pivotally connected to said carriage, and a plurality of holes on the top of said horizontal frame into which a pin of said latch is selectively inserted to adjustably position the seat towards or away from said pole, chain means attached to said upright posts for encircling a pole, crank means for tightening said chain means

to enable suspension from said pole, and cleat means on said post for penetrating the outer surface of said pole.

---

**4,129,199**
**ELEVATOR SYSTEM**
**Robert C. MacDonald, West Caldwell, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**
**Filed Apr. 29, 1977, Ser. No. 792,289**
**Int. Cl.[2] B66B *1/20***
**U.S. Cl. 187—29 R** **10 Claims**




1. A method of providing elevator service for a special floor of a building, which special floor is located between the top and bottom floors, comprising the steps of:

providing means for registering up and down hall calls from the special floor,

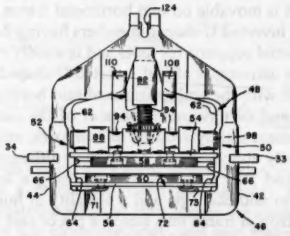
determining when registered up and down hall calls coexist from the special floor;

and giving a predetermined one of such coexisting hall calls priority over the other, according to the location of the special floor in the building,

said step of giving priority to a predetermined one of coexisting hall calls at the special floor including the steps of giving the up hall call priority over the down hall call when the special floor is located in the upper one-half of the building, and giving the down hall call priority over the up hall call when the special floor is located in the lower one-half of the building.

---

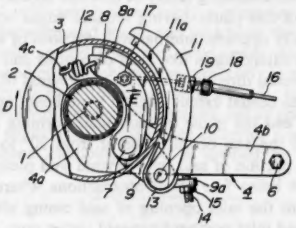
**4,129,200**
**DISC BRAKE AND MOUNTING THEREFOR**
**Donald D. Johannesen, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.**
**Continuation of Ser. No. 720,015, Sep. 2, 1976, abandoned. This application Sep. 22, 1977, Ser. No. 835,621**
**Int. Cl.[2] F16D *65/02***
**U.S. Cl. 188—71.1** **1 Claim**



1. In a disc brake having a rotatable rotor, a support adjacent the rotor, a pair of friction elements engageable with the rotor and a frame slidably supporting the pair of friction elements on opposite sides of the rotor, the frame pivoting relative to the support to urge the pair of friction elements into engagement with the rotor and the pair of friction elements pivoting relative to the frame, the improvement wherein said frame includes an opening defining guides for carrying a cylindrical push bar which engages one of said pair of friction elements, said guides also carrying said pair of friction elements, said cylindrical push bar pivoting with said frame when the latter pivots relative to said support in order to directly urge the one of said pair of friction elements into engagement with said rotor, said cylindrical push bar being adjustable axially relative to said frame to dispose the one of said pair of friction elements adjacent said rotor, said pair of friction elements and said cylindrical push bar pivoting with said frame relative to said support upon actuation of the disc brake to urge said pair of friction elements into engagement with said rotor, thereby retarding the rotation of said rotor, and said cylindrical push bar including a longitudinal axis substantially parallel to said rotor at the engagement with said pair of friction elements.

---

**4,129,201**
**BRAKE FOR VEHICLES**
**Yoshitaka Tamura, Ohtone, Japan, assignor to Bridgestone Cycle Co., Ltd., Japan**
**Filed Aug. 1, 1977, Ser. No. 820,896**
**Claims priority, application Japan, Oct. 29, 1976, 51-129340**
**Int. Cl.[2] F16D *49/16***
**U.S. Cl. 188—76** **10 Claims**



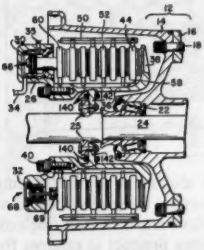
1. A brake for vehicles comprising a brake drum rotating in unison with a wheel of the vehicle, an inner pin fixed to a vehicle body within said brake drum, an inner shoe whose end is rotatably pivotally supported by said inner pin within said brake drum, a first arm formed integrally with said inner shoe and extending outwardly beyond said brake drum, an outer pin extending from an end of said first arm, an outer shoe rotatably pivotally supported by said outer pin for being brought into contact with an outer periphery of said brake drum, and actuating means for urging said inner and outer shoes toward and away from the brake drum, wherein said actuating means consists of an actuating wire having its one end connected to said inner shoe and an outer adapter connected to said outer shoe and springs for urging said inner and outer shoes away from said brake drum.

---

**4,129,202**
**AIRCRAFT BRAKE TORQUE LIMITER**
**Harry K. Winters, and Warren D. Chambers, both of South Bend, Ind., assignors to The Bendix Corporation, Southfield, Mich.**
**Filed Aug. 22, 1977, Ser. No. 826,799**
**Int. Cl.[2] B60T *8/12***
**U.S. Cl. 188—181 T** **12 Claims**

10. In a aircraft having a wheel rotatable about an axis, a multiple disc brake assembly for controlling said wheel comprising:

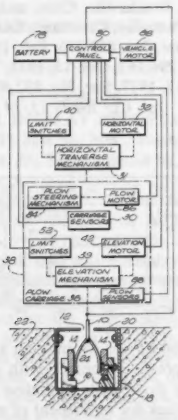
a torque-absorbing member mounted on said aircraft;
a set of rotors mounted for rotation with said wheel;
a set of stators mounted on said torque-absorbing member and adapted to frictionally engage said rotors;
fluid pressure responsive means carried by said torque-absorbing member to urge the rotors and stators into frictional engagement with one another when a brake application is effected, said fluid pressure responsive means including a housing defining a bore therewithin, a piston slidably mounted in said bore for effectuating said frictional engagement of said rotors and stators and cooperating with opposite ends of said bore to define a pair of variable volume, fluid pressure receiving chambers between fluid pressure responsive areas on opposite ends of the piston and corresponding ends of the bore; and means for communicating fluid pressure into one of said chambers to urge said piston in a brake application effecting direction;



sensor means operably connected to said brake for generating a signal when the brake torque generated by said brake reaches a predetermined level; and
valve means responsive to the signal generated by the sensor to communicate fluid pressure to the other chamber to oppose the fluid pressure force generated in said one chamber and thereby limit the brake torque to a predetermined maximum.

---

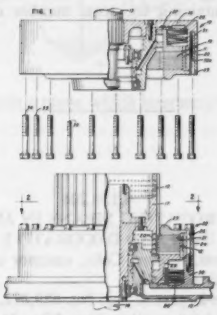
**4,129,203**
**ROADWAY VEHICLE**
**Nelson Berman, 1006 Iliff St., Pacific Palisades, Calif. 90272**
**Filed Jun. 13, 1977, Ser. No. 805,962**
**Int. Cl.[2] B60L** *5/40*
**U.S. Cl. 191—48** **10 Claims**




**10.** A roadway vehicle having a plow with elements for conducting energy to the vehicle and for contacting an external source of propulsion energy located in a slotted conduit below the surface of the roadway, which vehicle is not mechanically guided by elements associated with the roadway while contacting the external source.

---

**4,129,204**
**SPRING OPERATED CLUTCH WITH SMALL AND LARGE BOLTS**
**Richard L. Hedgcock, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.**
**Filed Jul. 29, 1977, Ser. No. 820,174**
**Int. Cl.[2] F16D** *13/44, 13/72*
**U.S. Cl. 192—89 B** **12 Claims**



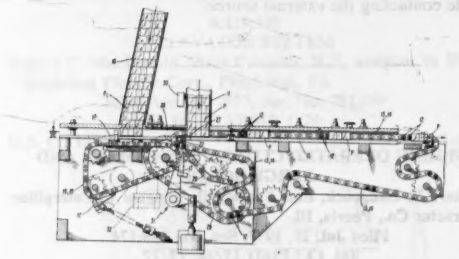
**1.** In a power drive assembly having a first wall member, a second wall member, a pack including a plurality of facially engageable plates, and a biasing spring acting between said first wall member and said pack for biasing said plates, improved means for securing said second wall member to said first wall member in an assembled arrangement with said pack and spring disposed therebetween, comprising:
a plurality of first bolts removably securing the second wall member to the first wall member, said first bolts individually having a strength less than that required to hold the wall members in the assembled arrangement against the biasing action of said spring; and
a second bolt removably securing said second wall member to said first wall member, said second bolt having a strength substantially greater than that of said first bolts individually and being sufficient to hold the wall members in the assembled arrangement against the biasing action of said spring.

---

**4,129,205**
**METHOD AND ASSEMBLY FOR FEEDING ARTICLES**
**Andrew W. Anderson, West Caldwell, and Milan Mateyka, Union, both of N.J., assignors to Scandia Packaging Machinery Company, Clifton, N.J.**
**Filed May 25, 1977, Ser. No. 800,398**
**Int. Cl.[2] B65G** *43/00*
**U.S. Cl. 198—358** **19 Claims**

**1.** An assembly for providing a continuous supply of articles, said assembly comprising:
(a) first supply means to gravity feed articles from a stack to an article introducing position located below the stack.
(b) first conveying means for moving articles from the article introducing position to a subsequent working position, and
(c) second conveying means for moving articles into the

article introducing position immediately behind said first conveying means to insert an article beneath said stack



while maintaining the total number of articles in said stack.

---

**4,129,206**

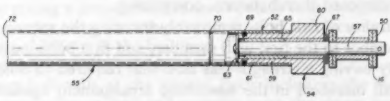
## CONTAINER ROTATING MEANS IN APPARATUS FOR CURING INKS AND DECORATIVE COATINGS

**Roblee L. Talbott, Golden, Colo., assignor to Coors Container Company, Golden, Colo.**

**Continuation-in-part of Ser. No. 689,072, May 24, 1976, abandoned, which is a continuation of Ser. No. 567,604, Apr. 14, 1975, abandoned. This application Mar. 24, 1977, Ser. No. 780,604**

**Int. Cl.[2] B65G *15/00***

**U.S. Cl. 198—377** **2 Claims**



1. An improved peg structure for use in container rotating apparatus of the kind having a moving conveyor chain carrying a plurality of pegs, each having a center pin mounted at an inner end as a chain pin on the conveyor and having a sleeve rotatably carried by the pin for being received in and carrying a cylindrical container of substantially larger diameter than the sleeve, and having frictional sleeve rotating means associated with the container rotating apparatus, wherein the improvement comprises:

(a) a hub roller rotatably mounted on said pin, terminating axially outwardly near the outer end of the pin, and having an exterior groove near the outer end thereof transverse to the hub roller axis;

(b) wherein said sleeve is engaged over a portion of the hub roller including said hub roller groove, which portion is relatively short relative to the length of the sleeve for supporting the sleeve;

(c) said sleeve having a frangible annular score line located axially outwardly from the outward end of the hub roller for allowing the sleeve to break in response to unusual bending stress without damaging the hub roller, and having an inner sleeve groove adapted to overlie said hub roller groove; and

(d) a resilient member mutually engaged in said hub roller groove and said inner sleeve groove for preventing unauthorized relative axial motion between the hub roller and sleeve.

**4,129,207**

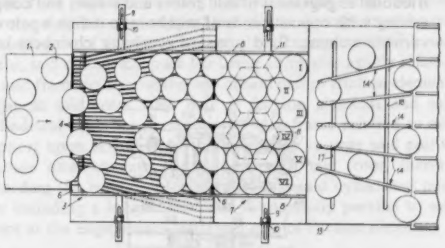
## PRODUCT ALIGNMENT MECHANISM

**William A. Cupp, Sandston, Va., assignor to AMF Incorporated, White Plains, N.Y.**

**Continuation-in-part of Ser. No. 671,777, Mar. 30, 1976, abandoned. This application Jan. 5, 1977, Ser. No. 757,114**

**Int. Cl.[2] B65G *47/12***

**U.S. Cl. 198—445** **12 Claims**



1. A product alignment apparatus employing a series of continuous conveyors integrally formed to act upon product advancing in a forward direction, including: first conveying means for receiving product at random from a source of supply, said first conveying means being formed of a plurality of spaced apart separating members for lateral distribution of product and simultaneously urging product forward at a predetermined speed; accumulating means disposed in proximity to said first conveying means laying in a plane coincidental thereto, for receiving product advancing from said first conveying means; guide means disposed at the respective lateral portions of said first conveying means and said accumulating means, for defining the maximum lateral travel of said product; and with said first conveying and accumulating means causing product to assume a tight pack hexagonal pattern; and second conveying means, being in proximity to and disposed at an angle with respect to said accumulating means, and being formed with a series of product orientators for receiving and urging product to travel in a downward and lateral direction in a predefined pattern of side by side longitudinal columns.

---

**4,129,208**

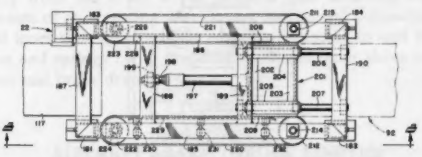
## HORIZONTAL STACK MOLDING MACHINE AND METHOD

**Edmond K. Hatch, Brecksville, Ohio, assignor to The Osborn Manufacturing Company, Cleveland, Ohio**

**Continuation of Ser. No. 659,376, Feb. 19, 1976, which is a division of Ser. No. 296,162, Oct. 10, 1972. This application Sep. 12, 1977, Ser. No. 832,408**

**Int. Cl.[2] B65G *15/14***

**U.S. Cl. 198—626** **8 Claims**



1. A mold traction device for moving a stack of juxtaposed molds in limited pressure contact with each other along a surface comprising drive belts operative frictionally to grip each side of such stack for movement of such stack along said surface, and unidirectional drive means for said belts, said unidirectional drive means including a piston-cylinder assembly, a longitudinally movable frame driven by said piston-cylinder assembly including racks on opposite sides thereof, and

one-way clutch means interconnecting said racks and said drive belts.

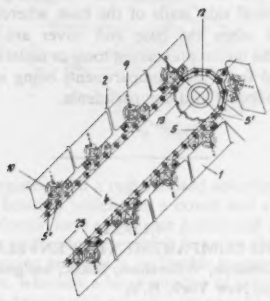
---

4,129,209

## BUCKET ELEVATOR

Friedrich Mayfeld, Kirschbaumweg 10, Westhofen, Westf., Fed. Rep. of Germany (5842)

Filed Nov. 29, 1976, Ser. No. 745,644
Claims priority, application France, Jan. 27, 1976, 76 02182
Int. Cl.[2] B65G *17/42*
U.S. Cl. 198—712 7 Claims



1. A bucket elevator comprising:
(a) an elongated link chain including a plurality of longitudinally consecutive link members,
(1) each link member being secured to two other link members for relative angular movement about respective pivot axes, whereby two pivot axes are associated with each link member;
(b) a plurality of buckets, each bucket including a bottom wall bounding a loading space in said bucket;
(c) connecting means fastening the bottom wall of each bucket to two portions of a selected link member,
(1) said two portions being spaced in the direction of chain elongation a distance greater than the corresponding spacing of the two pivot axes associated with said selected link member and the connecting means being articulatedly fastened to the two portions with sufficient lateral clearance to permit stress-free thermal expansion of the bottom wall of the bucket and play transverse to the direction of chain elongation between the connecting means and the two link member portions; and
(d) drive sprockets for longitudinally moving said chain in a closed loop.

---

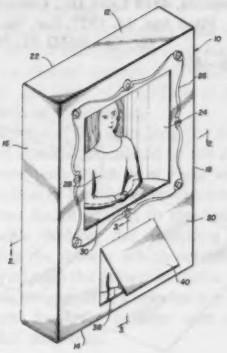
4,129,210

## DOLL DISPLAY RECEPTACLE

David A. Brown, 1611 31st St., NW., Washington, D.C. 20007, and E. A. Carmean, Jr., 3308 Legation St., NW., Washington, D.C. 20015

Filed Jun. 10, 1977, Ser. No. 805,541
Int. Cl.[2] B65D *5/44, 25/54*
U.S. Cl. 206—45.31 3 Claims

1. In combination, a doll and a display receptacle within which the doll is retained and supported for shipment and display, the receptacle comprising,
a folded blank box having interlocking top, bottom, side walls and front and rear panels, said front panel including a cut out portion serving as a window with a surrounding frame in the upper area thereof for display of the trunk portion of the doll within the box, and an integrally formed flap having a free end defining a notched edge,
said flap extending into the box through the cut out portion at substantially right angles to the front panel with the notched edge in engagement with the doll for retaining the doll within the box in engagement with at least the rear panel and in a spatial orientation relative to the box panels so that the front part of the displayed trunk portion



of the doll faces a plane which intersects the plane of the front panel.

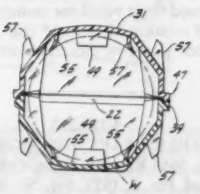
---

4,129,211

## WAFER PACKAGING SYSTEM

Carl J. Clement, Los Altos Hills; Fred H. Stengel, Palo Alto, and Kenneth S. Campbell, Mountain View, all of Calif., assignors to Monsanto Company, St. Louis, Mo.

Filed Sep. 7, 1976, Ser. No. 721,014
Int. Cl.[2] B65D *1/34, 85/30*
U.S. Cl. 206—213.1 23 Claims

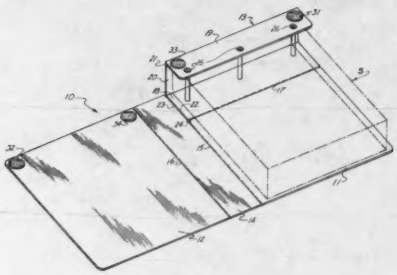


1. In a wafer packaging system for clean packaging and damage-free transporting of semiconductor wafers, said system, including a tubular, outer container, and a tubular, inner container, adapted to be contained by the outer container, the longitudinal axes of the inner and outer containers extending in the same axial direction, the improvement comprising means within the inner container for supporting a plurality of said wafers formed of a plurality of resilient projections extending toward the interior of the inner container from interior surface of the inner container, said resilient projections being spaced around and adapted for contacting the peripheral of each of the wafers, said wafers in spaced face-to-face relationship within the inner container, and resiliently supported solely by said resilient projections, axial shock-absorbing means for providing shock-absorbing coupling axially between the inner and outer containers along said longitudinal axes, and radial shock-absorbing means for providing shock-absorbing coupling radially between the inner and outer containers radially to said longitudinal axes.

## 4,129,212
## CARRIER AND STORAGE BINDER FOR FABRIC SAMPLES

Jack M. Hopkins, 4310 Lyon Dr., Columbus, Ohio 43220

Filed Apr. 14, 1977, Ser. No. 787,547
Int. Cl.[2] B65D *85/48*
U.S. Cl. 206—450 29 Claims



1. A carrier and storage binder for samples of sheet-form material disposed in stacked relationship comprising

a structurally rigid rear panel having a bottom edge, a top edge and a side edge extending therebetween,

a header secured by hinge means to said rear panel at the top edge thereof in upwardly projecting relationship, for relative pivoting of said header on said rear panel said header adapted to receive fabric sample sheets in retained relationship with the samples extending therefrom in superposed relationship to said rear panel,

a structurally rigid front panel having a side edge with said front panel hingedly interconnected with said rear panel at said side edges thereof for selective swinging movement relative to that edge between a closed position disposed in superposed relationship to said rear panel and said header with the sample sheets interposed therebetween and an open position wherein said front panel is disposed to permit visual inspection of the samples, said front panel having a vertical extent substantially equal to the combined vertical extent of said rear panel and said header, and

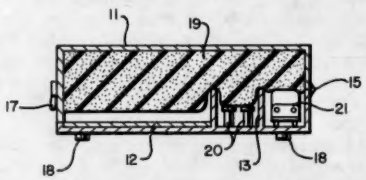
securing means adapted to selectively interconnect with said header and said front panel for maintaining said header in rigidly fixed relationship to said rear panel and maintaining said front panel in closed relationship to said rear panel.

---

## 4,129,213
## PORTABLE CRAFT AND HOBBY UNIT

William C. Fleig, 5664 Kingship Loop, Columbus, Ohio 43229

Filed Jun. 6, 1977, Ser. No. 803,669
Int. Cl.[2] B65D *69/00*
U.S. Cl. 206—575 7 Claims




1. A portable craft or hobby case-like unit having in combination a base, a removable cover for the base, means for attaching the removable cover to the base and means for hand carrying the case, wherein:

the base is comprised of a horizontal bottom, vertical side walls, interior walls forming compartments within said side walls for storage of tools or materials, a flat working surface adjacent to one or more of said interior walls forming one or more of said compartments and adjacent to the front wall, whereby the working surface is removable without removing any interior walls and whereby the front wall is substantially shorter than the other side walls and is substantially the same height as the top of said working surface; and

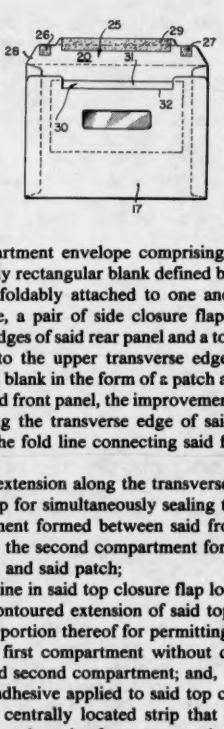
the cover is comprised of a horizontal top, vertical side walls, means for preventing tools or materials from being displaced from said compartments when the case is being carried, the vertical side walls being adapted to engage said vertical side walls of the base whereby the case is enclosed when the base and cover are attached and closed, the means preventing tools or materials from being displaced from said compartments being adapted to engage the top of said compartments.

---

## 4,129,214
## TWO COMPARTMENTED ENVELOPE

Wilfred H. Gendron, Wilbraham, Mass., assignor to Westvaco Corporation, New York, N.Y.

Filed Mar. 1, 1978, Ser. No. 882,072
Int. Cl.[2] B65D *27/34, 27/08*
U.S. Cl. 206—629 3 Claims




1. A two compartment envelope comprising, in combination, a first generally rectangular blank defined by a rear panel and a front panel foldably attached to one another along a transverse fold line, a pair of side closure flaps foldably attached to the side edges of said rear panel and a top closure flap foldably attached to the upper transverse edge of said rear panel, and a second blank in the form of a patch adhered to the inside surface of said front panel, the improvement comprising:

(a) a recess along the transverse edge of said front panel remote from the fold line connecting said front and rear panels;

(b) a contoured extension along the transverse edge of said top closure flap for simultaneously sealing the first envelope compartment formed between said front panel and said patch and the second compartment formed between said rear panel and said patch;

(c) a perforated line in said top closure flap located so as to separate the contoured extension of said top closure flap from the main portion thereof for permitting independent access to said first compartment without disturbing the contents of said second compartment; and,

(d) a pattern of adhesive applied to said top closure flap in the form of a centrally located strip that overlaps said perforated line and a pair of separate patches outboard of said centrally located strip whereby said centrally located adhesive strip simultaneously seals the first compartment and the central portion of said second compartment while said adhesive patches seal the outboard portions of said second compartment.

4,129,215

## DATA REGISTER

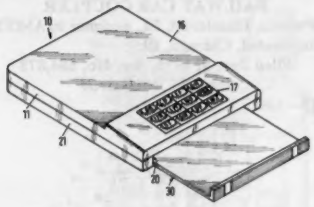
Hans Halm, Herne, Germany, assignor to Firma Confon AG, St. Gall, Switzerland

Filed Oct. 19, 1977, Ser. No. 843,592

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1977, 2741138

Int. Cl.[2] B07C *3/20*

U.S. Cl. 209—610 3 Claims




1. A data register with a register card selection mechanism comprising a housing which has a cover and a base with a plurality of selector keys which are juxtaposed and superimposed in rows and a drawer which is under the action of a compression spring and which is closable by means of a locking mechanism, whereby a large number of register cards are stacked in said drawer with selection tongues having openings formed in the rear edge portions thereof, said tongues increasing in size in step-like manner by, in each case, one opening-containing selection tongue from one side to the other of the register card with the first opening disposed opposite the first opening of the preceding register card, whereby each selection key is fixed to a swivel arm constructed as a lever which at its free end carries a card restraining pin, whereby the card restraining pins of the swivel levers are arranged in a row and cooperate with the register cards in such a way that, on depressing a selector key, all register cards located above the register card associated with this selector key are held back on extending the drawer by inserting the card restraining pins into the openings of the selection tongues of the register cards, while the selected register card and all the cards located below it are moved out with the drawer, as well as a device operable by the swivel levers of the selector keys for unlocking the drawer and releasing the register cards selected by a selector key by forcing out the unlocked drawer by means of the compression spring and provided with a cam for engaging with cam perforations on the register card,

(a) wherein the selector keys of the swivel levers comrise plate-like, square or rectangular blanks fixed to the ends thereof, with selector keys arranged one behind the other in any one row having a width which corresponds to the width of the particular swivel lever which carries three selector keys and are connected therewith in such a way that the selector key facing the card restraining pins at the rear ends of the swivel lever projects over the two adjacent swivel levers to the right and the front selector key projects over the two adjacent swivel levers to the left and the central selector key projects to the right and left over the swivel lever adjacent to said key on either side,

(b) wherein the card restraining pin of each swivel lever comprises an approximately U-shaped portion shaped onto the end of the swivel lever with a leg leading to the selector keys onto whose end is shaped a vertically upwardly directed rod which on operating a swivel lever engages from below into the register card opening or recesses.

(c) wherein the drawer comprises a plate-shaped drawer bottom with a front terminal strip which seals a drawer extension opening in the housing front wall when the drawer is inserted, said drawer being open at the back and on either side and in its rear edge area having a plurality of slot-shaped recesses corresponding to the number of card restraining pins and having a length corresponding to the length of the U-shaped portion on the ends of the swivel levers, while two lateral drawer limiting walls are formed by two boundary walls shaped onto the inner wall surface of the housing cover and arranged on either side of the plate-shaped drawer bottom,

(d) wherein for guiding the swivel levers each swivel lever is provided on the end carrying the card restraining pin with a vertical slot-shaped opening into which engages a cam shaped onto the inner wall surface of the housing cover and is guided in the opening,

(e) wherein the mechanism for unlocking the drawer comprises a U-shaped shackle articulated to the cover of the housing and whose web which is at right angles to the longitudinal direction of the swivel lever rests on the top of the swivel arms and is subject to the action thereof, whilst each shackle member has a locking cam on its bottom face facing the drawer which cooperates with a counter-cam shaped onto the drawer in such a way that on raising the shackle on operating a selector key the locking cam is disengaged from the counter cam so that the drawer is extended outwards.

---

4,129,216

## DISPLAY STAND FOR SEWING-THREAD SPOOLS AND LIKE ARTICLES

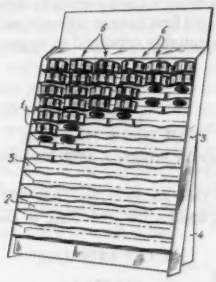
Henri Schick, Paris, France, assignor to Promotion Etude Conditionnement d'Articles de Mercerie - PECAM Internat., Orly, France

Filed Jun. 3, 1977, Ser. No. 803,417

Claims priority, application France, Jun. 11, 1976, 76 17739

Int. Cl.[2] A47F *7/16*

U.S. Cl. 211—13 10 Claims




1. A stand, particularly a display stand, comprising a housing having at least two elongated shelves parallel to each other and spaced from each other in direction normal to the elongation of said shelves and thereby defining a space between each other; a plurality of supports rotatably and detachably received in the space between the shelves for rotation about respective first axes normal to the elongation of said shelves; a plurality of members rotatably and detachably mounted on each of said supports, for rotation about respective second axes parallel to said first axes and normal to said elongation of said shelves; first means for detachably installing each of said supports in the space between the shelves; and second means for detachably installing each of said members on said supports.

---

4,129,217

## PORTABLE SPRAY PAINTING STATION

Talmage D. Campbell, 706 E. Silver Springs Blvd., Ocala, Fla. 32670

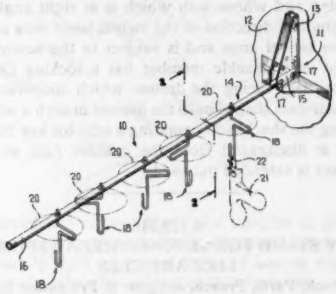
Filed Oct. 17, 1977, Ser. No. 842,990

Int. Cl.[2] A47F *5/08;* F16B *45/00*

U.S. Cl. 211—95 6 Claims

1. An apparatus for providing a portable station where an article may be suspended or removed therefrom after being coated, said apparatus including a support base capable of

being suspended from a generally vertical surface, a beam connected to and extending generally longitudinally horizontally from said support base, at least two first hangers rotatably depended from said beam, said first hangers being positioned in spaced relationship relative to each other and from said support base, a second hanger corresponding to each of said first hangers and being suspended therefrom, each of said second hangers being engagably detachable from a respective said first hanger, each of said first hangers having a plurality of interconnected sections, a first section of said first hanger being a



swivel depending vertically from said beam and being pivotally connected thereto, a second section of said first hanger being a handle horizontally depending from said first section of said first hanger, said second section of said first hanger being capable of being rotated thereby moving said first section of said first hanger pivotally relative to said beam, a third section of said first hanger being a hook vertically depending from said second section of said first hanger wherein said third section of said first hanger is suitably arranged to engagably receive said second hanger.

---

**4,129,218**

**MULTIPLE HANGER**

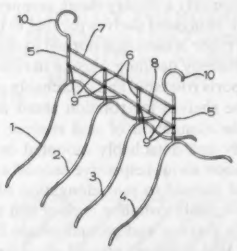
**Guido Koellner, Leyher Strasse 9, 8500 Nuremberg, Fed. Rep. of Germany**

**Filed Oct. 25, 1977, Ser. No. 844,862**

**Claims priority, application Fed. Rep. of Germany, Nov. 10, 1976, 2651261**

**Int. Cl.[2] A47F *5/08***

**U.S. Cl. 211—116** **8 Claims**



1. A multiple hanger for garments such as blouses, shirts and the like, comprising at least three generally parallel hanger elements on which said garments are hung, a connecting rod pivotally connected to each of said hanger elements, and a guiding rod pivotally connected to each of said hanger elements, said guiding rod being parallel to and spaced from said connecting rod, said pivotally connected guiding rod, connecting rod, and hanger elements forming a parallelogrammatic linkage such that all of said hanger elements pivot simultaneously in parallel array, whereby when in use the multiple hanger is pivotal to a first position wherein the connecting rod and guiding rod are horizontally disposed and the hanger elements are all disposed at the same elevation, and to a second position wherein the connecting rod and guiding rod are substantially vertically disposed and the hanger elements are disposed at different elevations substantially one above the other.

---

**4,129,219**

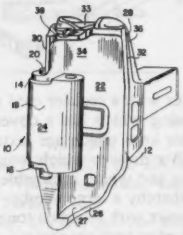
**RAILWAY CAR COUPLER**

**Walter R. Polanin, Hazelcrest, Ill., assignor to AMSTED Industries Incorporated, Chicago, Ill.**

**Filed Jun. 9, 1975, Ser. No. 584,875**

**Int. Cl.[2] B61G *3/04***

**U.S. Cl. 213—100 R** **2 Claims**



1. In combination with a railway car body having a coupler head of the type having upper and lower lugs on one side of the head, a guard arm on the other side of the head, a face between the lugs and the guard arm partially lying in a vertical plane, a knuckle pivotally supported by the lugs and partially lying in a vertical plane, the knuckle and face being spaced from one another when the knuckle is in a closed position to define an opening, the knuckle having an upper and a lower surface,

a lower shelf on the head having a surface spaced from and located downwardly below the lower surface of the knuckle, and

an upper shelf on the head having a top wall spaced from and located upwardly above the upper surface of the knuckle and having a forward leading edge, the improvement wherein,

said leading edge of said upper shelf being divided into a lower vertical surface portion and an upper segment with said upper segment being inclined upwardly and rearwardly toward the railway car at an angle of at least 4°–43′ to the vertical,

said upper shelf having a forward rib formed on said top wall, and said upper segment of said leading edge extending upwardly above said top wall onto said forward rib.

---

**4,129,220**

**BAR STOCK FEED APPARATUS**

**Anders A. Peterson, Elmira, and Francis D. Catlin, Horseheads, both of N.Y., assignors to Hardinge Brothers, Inc., Elmira, N.Y.**

**Filed Nov. 1, 1976, Ser. No. 737,914**

**Int. Cl.[2] B65H *5/16***

**U.S. Cl. 214—1.4** **23 Claims**

1. Bar stock feed apparatus comprising:

(a) an elongated tubular member adapted to receive a length of bar stock therein,

(b) standard means for supporting said tubular member in an operative position for feeding the bar stock and in an inoperative position wherein bar stock can be loaded into said tubular member,

(c) a fluid actuated plunger received in said tubular member for longitudinal movement therein,

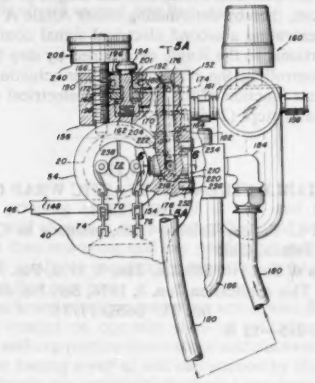
(d) means for supplying fluid under pressure to said tubular

member behind said plunger to thereby cause said plunger to advance longitudinally within said tubular member,

(e) a locking mechanism associated with said standard means including means for mechanically constraining said tubular member in said operative position,

(f) pressure responsive safety valve means associated with said standard means adapted to be connected to said fluid supply means responsive to the presence of said tubular member when in operative position to automatically permit a supply of fluid to said plunger and responsive to the absence of said tubular member from said operative position to automatically interrupt or reduce the supply of fluid to said plunger,

(g) said plunger comprising at least two coaxial sections connected for unitary axial movement and for a relative rotational movement about their axis and wherein the forward one of said two sections includes means for receiving one end of a length of bar stock.



---

**4,129,221**

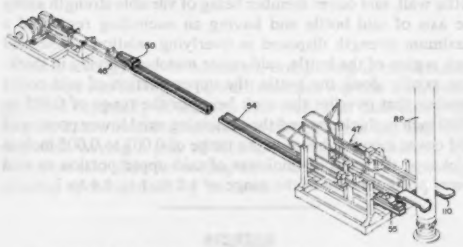
**PIPE HANDLING APPARATUS**

**Walter H. Moller, Bellevue, Wash., assignor to Western Gear Corporation, Everett, Wash.**

**Filed Apr. 30, 1976, Ser. No. 682,052**

**Int. Cl.[2] E21B *19/14***

**U.S. Cl. 214—2.5** **6 Claims**



3. A riser/casing pipe adapter for handling large diameter pipe each having a stabber end and a skate end in a smaller diameter pipe transporting system for moving axially and lifting lengths of pipe of a first diameter to and from a drill rig floor in conjunction with a pipe elevating device, said transporting system including a first skate, a first skate track for guiding the first skate and first skate driving means for moving the first skate along the first skate track, the improvement comprising an elongated skate adapter for pipe of a larger second diameter having a first end supported for movement along said first skate track and a second end supported by and coupled to said first skate whereby movement of said first skate will move said skate adapter, said skate adapter having a second track along the length of the adapter for supporting the skate end of the larger diameter pipe as it is moved along said adapter responsive to raising or lowering of the stabber end of the large diameter pipe by the pipe elevating device.

---

**4,129,222**

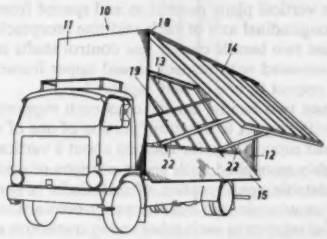
**DEVICE FOR EMPTYING CONTAINERS OR SIMILAR**

**Dan Richardsson, Södra Kyrkogatan 5, Lidköping, Sweden (531 00)**

**Filed Sep. 15, 1977, Ser. No. 833,696**

**Int. Cl.[2] B60P *1/28***

**U.S. Cl. 214—17 D** **3 Claims**



1. A device for emptying a container, said container comprising a pair of side walls which are situated opposite each other and which are pivotally mounted at their upper edges about upper hinges, a bottom wall including a fixed bottom plate and a movable bottom plate pivotally connected by a lower hinge to the lower edge of one of said side walls, and a fixed bottom construction, said device comprising means for pivoting the side walls about the upper hinges and displacing the movable bottom plate in relation to the fixed bottom plate, wherein said means comprises at least one jacking means having two members movable relative to each other, a first of said members having an end pivotally attached to a side edges of the bottom construction of the container, and the second member being pivotally attached to said one of said side walls and the device further includes at least one elongated member connecting the side walls to each other.

---

**4,129,223**

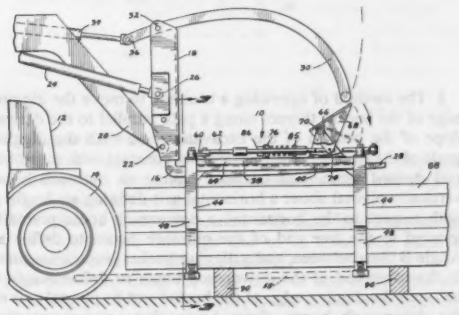
**BUNDLE CARRIER ATTACHMENT FOR FORK LIFT TRUCKS**

**Wallace P. Probst, Marcell, Minn., assignor to Robil Company, Minneapolis, Minn.**

**Filed Sep. 22, 1977, Ser. No. 835,688**

**Int. Cl.[2] B66F *9/06, 9/14***

**U.S. Cl. 214—620** **10 Claims**



1. A bundle carrier attachment for use with a fork lift truck

having at least two power operated, vertically movable, fork lift truck tine means extending substantially horizontally ahead of the truck in direction longitudinally of the axis of movement of the truck, said bundle carrier attachment including:

A. An upper framework including a longitudinally extending fork lift truck tine receptacle for each fork lift truck tine means, each said receptacle having a central longitudinal axis said framework having at least a first longitudinally extending framework member adjacent and parallel to a first of said fork lift truck tine receptacles, said first framework member forming a first longitudinal edge portion of the upper framework;

B. at least two vertical, spaced apart, load support legs integral with said framework and extending downwardly from positions adjacent opposite end portions of said first framework member, said load support legs both lying in a single vertical plane parallel to and spaced from the central longitudinal axis of each said tine receptacle;

C. at least two bundle carrier tine control shafts each rotatably mounted with respect to said upper framework and with respect to one of said support legs;

D. at least two bundle carrier tines each supported at one end with respect to a bottom portion of one of said vertical load support legs for rotation about a vertical axis and operably associated with lower portions of said shafts to be rotatable upon rotation of said shafts between a first position wherein said bundle carrier tines are in mutually parallel relation to each other and in transverse relation to said first longitudinally extending framework member and a second position wherein said bundle carrier tines are in mutually aligned relation with each other and in parallel and substantially vertically aligned relation below said framework member; and

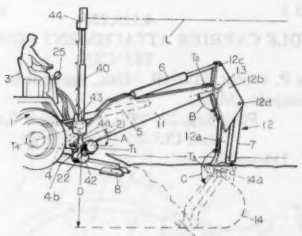
E. means mounted with respect to said framework for rotating said shafts to move said bundle carrier tines between said first and said second positions.

---

## 4,129,224
## AUTOMATIC CONTROL OF BACKHOE DIGGING DEPTH

**Ted L. Teach, Dayton, Ohio, assignor to Laserplane Corporation, Dayton, Ohio**

**Filed Sep. 15, 1977, Ser. No. 833,432**
**Int. Cl.² E02F *9/20***
**U.S. Cl. 214—763** **6 Claims**



1. The method of operating a backhoe to move the digging edge of the bucket thereof along a path parallel to the desired slope of the bottom of the excavation and with the digging angle of the bucket being substantially constant with respect to said desired slope, said backhoe having an outreach boom vertically pivotal about a horizontal axis defining an Angle A with respect to the horizontal, a downreach boom pivotally secured to the free end of the outreach boom to define an Angle B therebetween, and a digging bucket pivotally secured to the other end of the downreach boom to define Angle C between the digging edge of the bucket and its pivotal axis on the downreach boom, there being three power-actuating means respectively operating on said outreach boom, said downreach boom, and said digging bucket to vary said Angles A, B and C, comprising the steps of:

(1) manually controlling the power-actuating means determining Angle B to move said bucket through a digging stroke;

(2) generating a first electrical signal continuously proportional to Angle B;

(3) controlling one of the two remaining power-actuating means as a trigonometric function of Angle B, the length of the outreach boom, and the length of the downreach boom, thereby determining either Angle A or Angle C;

(4) generating a second electrical signal continuously proportional to the Angle determined by step (3); and

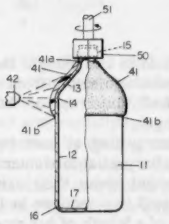
(5) controlling the remaining power-actuating means as a linear function of the sum of the electrical signals generated in steps (2) and (4).

---

## 4,129,225
## VARIABLE STRENGTH PLASTIC WRAP ON GLASS BOTTLES

**Edward L. Bailey, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio**

**Division of Ser. No. 585,226, Jun. 9, 1975, Pat. No. 4,007,246.**
**This application Jun. 3, 1976, Ser. No. 692,266**
**Int. Cl.² B65D *11/16***
**U.S. Cl. 215—12 R** **11 Claims**



1. A bottle comprised of an integral annular glass wall encircling a longitudinal axis of the bottle and including a neck and an upper rim defining a mouth opening, the rim being adapted for sealingly connecting a closure thereon, the combination with an exterior cover member encircling the wall of said bottle including said neck comprised of a film formed in situ from a powdered polymeric material that is in a conforming snug encircling engagement on the exterior surface of said bottle wall, said cover member being of variable strength along the axis of said bottle and having an encircling region of a maximum strength disposed in overlying relation to the said neck region of the bottle, said cover member varying in thickness axially along the bottle, the upper portion of said cover member that overlies the neck being in the range of 0.005 to 0.010 inch in thickness and the remaining axial lower portion of said cover member being in the range of 0.003 to 0.005 inch in thickness, the ratio of thickness of said upper portion to said lower portion being in the range of 1.2 to 1 to 1.4 to 1.

---

## 4,129,226
## HINGED CLOSURES FOR CONTAINERS

**Stephen J. Percival, Mardstone, England, assignor to Johnsen & Jorgensen (Plastics) Ltd., London, England**

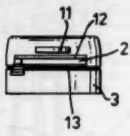
**Filed Sep. 19, 1975, Ser. No. 615,066**
**Claims priority, application United Kingdom, Sep. 20, 1974, 41159/74**
**Int. Cl.² B65D *41/60***
**U.S. Cl. 215—235** **1 Claim**

1. A hinged closure for closing the mouth of a container comprising:

an annular anchor band attachable to the container around the mouth thereof, and

a cap portion joined to said anchor band around the entire circumference thereof by means of a first weakened portion defining a first tear line extending around substantially the entire circumference, said cap having a thumb tab extending radially outwardly therefrom,

a second weakened portion defining a second tear line spaced axially from said first tear line and extending partially around the circumference of said closure a predetermined distance on each side of said thumb tab, said first and second tear lines defining a tear band extending along the length of said second tear line, and




means for grasping said tear band at one end thereof, whereby said closure is opened by pulling said tear band open and then removing said cap portion by pulling said thumb tab axially to cause said cap portion to be severed along said first tear line,

a pair of thickened portions extending across said first tear line and located on opposite sides of said thumb tab, whereby said cap portion flexes about said thickened posts during the tearing away of said cap portion by the action of said thumb tab until said thickened portions tear to permit the remainder of said first tear line to be broken.

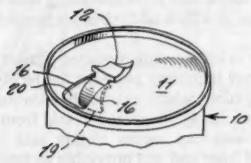
---

**4,129,227**

## ECOLOGY POP-IN CONTAINER TOP

**Theodore K. O'Neil, and George Spector, both c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007**

**Filed Mar. 17, 1978, Ser. No. 887,875**
**Int. Cl.² B65D *41/32***
**U.S. Cl. 220—267** **4 Claims**




1. An ecology pop-in container, comprising in combination a beverage can having an upward rounded top end wall, a slide mounted externally of said top end wall, said slide being carried on a downward rivet riveted through said top end wall, said slide having a pair of lock-in-legs attached thereto, and means on said slide for rolling down side edges of a beverage pouring opening made by said slide.

---

**4,129,228**

## MEDICATION CONTAINER WITH QUICK RELEASE CLOSURE

**John W. Stoneback, 328 East 262 St., Cleveland, Ohio 44132**

**Filed Apr. 5, 1976, Ser. No. 673,684**
**Int. Cl.² B65D *41/04***
**U.S. Cl. 220—293** **14 Claims**

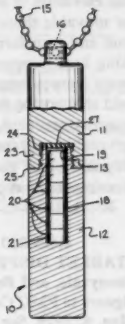
1. A medicine container comprising:

(a) a pair of members defining complemental male and female portions each having pilot and threaded sections;

(b) the pilot section of one portion being axially shorter than the pilot section of the other portion;

(c) the thread of the other portion threaded section having a first crest surface of a diameter different than the one pilot section by a first amount to provide a first pilot action as the portions are brought into telescopic relationship;

(d) the thread of the one portion threaded section having a second crest surface of a diameter different than the other




pilot section by a second amount less than the first to provide a second and more precise pilot action as the portions are brought into telescopic relationship;

(e) whereby to bring the threads into axial alignment prior to connecting relative rotation of the portions to connect the members.

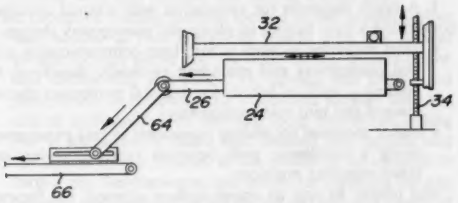
---

**4,129,229**

## ARTICLE DISPENSING APPARATUS

**William L. Brown, Easton, Pa., assignor to SI Handling Systems, Inc., Easton, Pa.**

**Filed Jan. 31, 1977, Ser. No. 763,785**
**Int. Cl.² B65B *47/02***
**U.S. Cl. 221—129** **15 Claims**




12. Apparatus comprising:

(a) means supporting a plurality of horizontally disposed shelves one above the other, means dividing said shelves into a plurality of lanes,

(b) a discrete pusher associated with each lane for pushing articles toward the edge end of its associated shelf, a separate actuator for each pusher,

(c) a conveyor along the front edge of said shelves for receiving goods from said lanes, motor means for selectively elevating said conveyor so that it may receive goods from each of said shelves, said conveyor being an endless con-

veyor having a length approximately equal to the length of the front edge of the shelves,

(d) a picking head for controlling each pusher actuator, said picking head being supported for vertical movement with said conveyor and for independent movement horizontally along said conveyor, said picking head being supported above the elevation of said conveyor and having a sloping member movable therewith for receiving articles from a shelf lane and transferring the same to said conveyor, the picking head supporting a gear for movement toward and away from a vertical plane containing the front edge of said shelves for driving any preselected one of said pusher actuators, said picking head gear being supported for pivotable movement about an axis which is horizontally disposed, and cam means for selectively shifting said gear toward said plane.

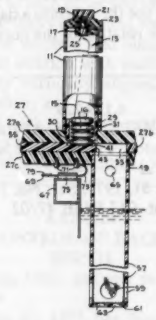
---

**4,129,230**

## TABLET DISPENSER

**Ronald J. Billett, Sunnyvale, and Bruce M. Harper, San Jose, both of Calif., assignors to FMC Corporation, San Jose, Calif.**

**Filed Jan. 6, 1975, Ser. No. 538,987**
**Int. Cl.[2] B65G *1/08***
**U.S. Cl. 221—268** **3 Claims**



1. A tablet dispenser for association with a liquid container comprising a base having an elongated passageway therein,

a tablet magazine secured to said base communicating with said passageway and extending vertically therefrom for holding a stack of tablets for gravital movement thereof toward and into said passageway,

a pusher mounted for sliding movement in said passageway along a rectilinear path between tablet-receiving and tablet-rejecting positions,

said pusher having its upper surface adjacent the forward end thereof cut away to define an elongated recess extending rearwardly therefrom defining a flat tablet support surface parallel to said rectilinear path,

said pusher when in said tablet-receiving position being disposed along said path in said passageway with its said forward end adjacent said tablet magazine in unobstructing relation thereto, thereby to permit a lowermost tablet to gravitate into said passageway in front of said pusher,

said pusher when advanced along said path toward said tablet-ejecting position being disposed in said passageway with said elongate recess underlying said tablet magazine thereby to receive and continuously support the next lowermost tablet without vertical movement thereof as the lowermost tablet is pushed to a discharge position,

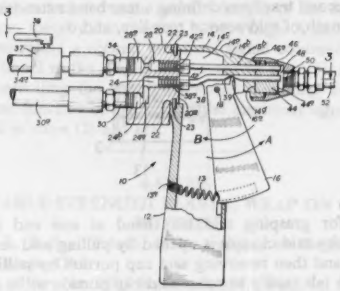
the height of said pusher forward end below said recess being less than the height of a tablet with the height of said passageway being greater than tablet height whereby said pusher forward and engages only the lowermost tablet in the stack.

**4,129,231**

## PORTABLE, HAND-HELD GUN FOR DISPENSING MULTIPLE FLUIDIC COMPONENTS TO A MIXER

**Charles L. Larson, Grants Pass, Oreg., assignor to Jeddeloh Bros. Sweed Mills, Inc., Gold Hill, Oreg.**

**Filed Nov. 13, 1975, Ser. No. 631,714**
**Int. Cl.[2] B05B *7/04***
**U.S. Cl. 222—145** **3 Claims**



1. A portable, hand-held, readily disassemblable fluid dispensing gun for introducing fluidic materials from a supply source to a mixing conduit or the like comprising:

a handle including a barrel;

a head assembly detachably connected to a rear end of said barrel, said head assembly having plural fluid conducting passages extending therethrough;

a plurality of flexible, fluid conducting tubes each being detachably connected to said head assembly and communicating with an associated one of said passages, said tubes extending from said head assembly through said barrel and outwardly from a front end of said barrel, said tubes being detachable from said head assembly when said assembly is separated from said barrel;

a trigger lever having a member extending from one end thereof, said lever being mounted on said handle and normally biased to a position in which said member deforms said tubes, said lever also being selectively movable to a position in which said tubes are nondeformed by said member;

A removable orienting plug mounted against said front end of said barrel including passages for receiving said fluid conducting tubes which extend therethrough; and

cap means detachably connected to said front end including an outlet, said cap means urging said orienting plug against said front end and providing an internal wall of an initial mixing chamber adjacent said front end, said cap means also providing a mounting for said mixing conduit extending outwardly therefrom.

---

**4,129,232**

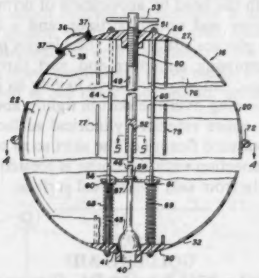
## FLUID SUBSTANCE TRANSPORTING AND STORAGE TANKS

**Robert B. Coupar, 4447 Narvaez Crescent, Victoria, British Columbia, Canada (V8N 2S7)**

**Filed Aug. 12, 1977, Ser. No. 824,115**
**Int. Cl.[2] B65D *47/30***
**U.S. Cl. 222—173** **6 Claims**

1. A tank for holding and transporting fluid substances, comprising: a spherical wall enclosing a storage chamber for a fluid substance; a discharge opening in a portion of the wall constituting the bottom of the spherical wall; a seat in the chamber and surrounding the discharge opening; an inlet opening in a portion of the wall forming the top thereof; a cover for the inlet opening; a plug in the chamber positioned to engage the seat and thereby close the discharge opening; and operating means connected to the plug and operable selectively to move said plug onto and off the seat respectively to close and open the discharge opening to retain said fluid substance in the

chamber and to allow said substance to flow out of the chamber, said operating means comprising spring means connected to the plug and normally urging the latter away from the seat, nut means near the top portion of the wall and a shaft threaded through said nut means and extending out through said wall,



said shaft having an inner end connected to the plug, whereby rotation of the shaft in one direction causes the shaft to move the plug onto the seat against the action of said spring means and rotation of the shaft in the opposite direction permits the spring means to move the plug off the seat.

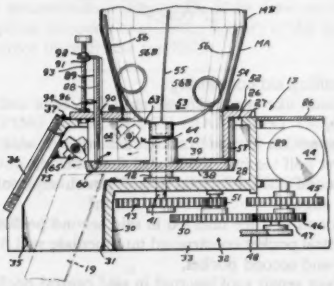
---

**4,129,233**

## METERING APPARATUS FOR FLOUR AND OTHER MATERIALS THAT TEND TO BRIDGE

**Richard W. Schmader, 50 Myopia Rd., Winchester, Mass. 01890**

**Filed Nov. 11, 1976, Ser. No. 740,888**
**Int. Cl.² G01F *11/00***
**U.S. Cl. 222—227** **4 Claims**



1. Apparatus for dispensing from a container having a downwardly opening outlet of a reduced cross sectional area, flour, flour mixes and other dry materials that tend to bridge and thus prevent a uniform and constant flow through the outlet by gravity, said apparatus including a housing having a shelf, a turntable of a diameter greater than said outlet and rotatably supported by said shelf with a portion protruding therefrom to provide a segment from which material is to be discharged, a cover including a depending wall overlying with a working clearance marginal portions of said turntable except said segment and including ends defining an outlet passage leading thereto, said turntable, cover and said depending wall defining a chamber for the material and said cover having a port opening into the chamber over the axis of the turntable to permit entry of material from the container, the inlet end of said passage disposed to receive material as the turntable turns, a drive connected to said turntable and operable to effect its turning at a slow rate, probe means carried by said turntable and extending upwardly through said port and into the container when the container is positioned to discharge material into said chamber, then to break up any bridging of the material, means extending transversely of the direction of flow in said passage and operable to ensure the discharge of a predetermined volume of material at a selected rate from the protruding segment, said means including means to remove material from the margin of said segment, means adjacent the infeed end of the outlet passage operable to pass material to the first named means, and an adjustable gate between the first and last named means.

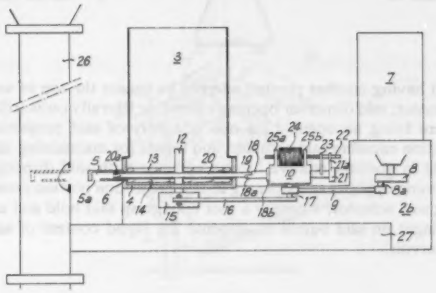
---

**4,129,234**

## MICRO-PROPORTIONER APPARATUS FOR DIVIDED PRODUCTS

**Gilbert G. Conca, Cabries, France, assignor to Transitube Project, Aix-En-Provence, France**

**Filed Jan. 7, 1977, Ser. No. 757,300**
**Claims priority, application France, Jan. 16, 1976, 76 01925**
**Int. Cl.² G01F *11/06***
**U.S. Cl. 222—235** **11 Claims**



1. A micro-proportioner apparatus for dispensing divided or powdery products including:

a vertical hopper which contains said products, which hopper includes a bottom, a cylindrical side channel for outlet of the products, said channel having a mouth which opens slightly above the bottom of the hopper,

a cylindrical sliding rod located inside said vertical hopper, coaxial with said channel and having a front end,

two groups of rotating paddles located in said hopper, above said bottom in two horizontal planes with one of said groups located above and the other of said groups below said sliding rod; and means for driving said sliding rod periodically in reciprocating translation parallel with the axis of said channel, so that said front end of the sliding rod is alternatively inside said channel and outside said channel in spaced relation to the mouth of the channel to form a gap therebetween; and means for adjusting the gap between said front end of the sliding rod and said mouth of the channel to vary the amount of products dispensed at each sliding rod stroke.

---

**4,129,235**

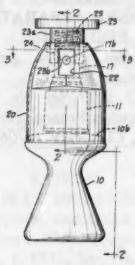
## MANUALLY ACTUATED SPRAY HEAD WITH COMFORT HOLD AND ACTUATOR

**Edwin J. Haas, 17004 Pearldale Ave., Cleveland, Ohio 44135**

**Filed May 26, 1977, Ser. No. 800,931**
**Int. Cl.² B05B *11/00*; G01F *11/12***
**U.S. Cl. 222—321** **6 Claims**

2. A manually actuated spray container consisting of an imperforate liquid reservoir of a size to be held in the hand of a user, said reservoir having a neck and a dispenser opening at the top, a closure for said opening including a manually operated pump for moving liquid in said reservoir out through said dispenser opening, an actuator at the top of said closure operatively associated with said pump when moved up and down, said reservoir having a top of greater diameter than said closure, a comfort hold enclosing said top and said closure and

said actuator, said comfort hold being generally cylindrical and hollow and having a bottom edge of a diameter to snap on said reservoir top diameter, said hold being of a diameter to be comfortably held in the hand of a user, said hold having a top opening, a circular button having a diameter greater than said opening, said button having a central downwardly extending projection adapted to pass through said top opening, said projection having a portion positioned to engage said actuator



and having another portion adapted to encase the top of said actuator, said dispenser opening extending laterally outwardly, there being an opening on one side only of said projection portion encasing said actuator, and means for maintaining said hold in position relative to said actuator with said dispenser opening opposite said opening in said projection portion encasing said actuator, whereby a user may grasp said hold and use a finger on said button to dispense the liquid content of said reservoir.

---

**4,129,236**

## CONTAINER WITH SPOUT CONNECTION

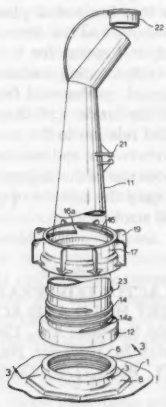
**Norman E. Wrycraft, Malton, and Alistair K. Collins, Willowdale, both of Canada, assignors to Vulcan Industrial Packaging Limited, Rexdale, Canada**

**Filed Jun. 23, 1977, Ser. No. 809,301**

**Claims priority, application United Kingdom, Jun. 29, 1976, 26989/76**

**Int. Cl.[2] B65D *25/40***

**U.S. Cl. 222—570** **4 Claims**



1. A container having in its top a pouring aperture bounded by a raised metal neck with an outwardly turned bead, a spout releasably retained on the neck comprising a one-piece moulding of stiffly bendable plastics material comprising at one end a flared skirt with a circumferentially-continuous internal groove in tight snap-fitting connection on said bead, said skirt having a generally cylindrical exterior surface extending from the bottom edge of the spout upward to an inwardly stepped shoulder portion that engages sealingly on the top of the metal neck, an externally threaded intermediate portion above the stepped portion, and an elongated upper portion tapering from the threaded portion to a relatively slender elongated pouring outlet portion at the end remote from the skirt, said groove levering off from and disconnecting from said snap-fitting connection with the bead by application of normal hand pressure to the upper and outlet portions, and a locking collar moulded from plastics stiffer than the plastics material of the spout and comprising an upper end part threaded on said threaded portion, and a lower sleeve having an inner cylindrical surface extending over the skirt in tightly abutting engagement with the entire exterior cylindrical surface of the skirt and resisting outward flexure of the skirt so as to prevent said levering disconnection until the collar is rotated to retract the sleeve upwardly from said cylindrical surface.

---

**4,129,237**

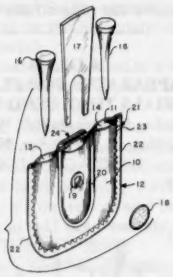
## GOLFER'S AID

**Charles E. Grinder, 9366 Schaefer Rd., Converse, Tex. 78109**

**Filed Feb. 11, 1977, Ser. No. 767,780**

**Int. Cl.[2] A45C *11/00*; A63B *57/00***

**U.S. Cl. 224—5 C** **5 Claims**



1. A golfing aid comprising:

a. a pouch-like container having a first edge and a second edge,

b. a first pocket formed in said pouch adjacent said first edge,

c. a first golf tee inserted in said first pocket,

d. a second pocket formed in said pouch adjacent said second edge,

e. a second golf tee inserted in said second pocket,

f. a central pocket constructed intermediate said first pocket and said second pocket,

g. a divot repair tool inserted in said central pocket,

h. a snap fastener attached to a first side of said central pocket for securing a ball marker to said central pocket,

i. a spring clip secured to a second side of said central pocket, said clip having a configuration suitable for clipping to an item of golfer's apparel, and

j. a flexiole covering encasing said spring clip.

---

**4,129,238**

## APPARATUS FOR FEEDING A WEB IN REGISTRY BETWEEN WEB PASSES THROUGH A PROCESSING MACHINE

**Josef Herd, Münster b. Dieburg, Fed. Rep. of Germany, assignor to Maschinenfabrik GOEBEL GmbH, Fed. Rep. of Germany**

**Filed Sep. 13, 1977, Ser. No. 832,983**

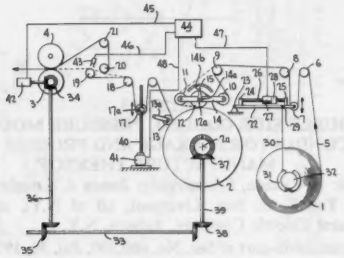
**Claims priority, application Fed. Rep. of Germany, Sep. 21, 1976, 2642381**

**Int. Cl.[2] B65H *23/18***

**U.S. Cl. 226—29** **4 Claims**

1. Apparatus for use with a machine processing a continuous moving web having markings representing repeat lengths applied thereto during a prior web pass through the machine, a draw mechanism for unwinding the web from a wound roll,

an adjustable guide roll for applying a maintained tension to the web downstream of the draw mechanism relative to web movement, the apparatus comprising: a braking device coupled to the wound roll for braking the web upon unwinding by the draw mechanism; an adjustable dancer roll for applying a maintained tension to the web upstream of the draw mechanism; the dancer roll being connected to the braking device for establishing a direct relationship between a decrease and increase in web tension, upstream of the draw mechanism, and an increase and decrease in braking effect on the web being unwound by the draw mechanism; drive means for operating the machine as well as the draw mechanism; means for scanning



the speed of the web movement and for scanning the web markings between the adjustable guide roll and the machine for measuring any elongation of the web by the relative positions of the markings; first and second remotely controllable and independent means for respectively varying the adjustment of the guide roll and of the dancer roll for varying the maintained tension respectively applied downstream and upstream of the draw mechanism; and means responsive to the scanning means for operating the first and second remotely controllable means for varying the maintained tension to the web both downstream and upstream of the draw mechanism in an appropriate direction to maintain registry of the web during passes thereof through the machine.

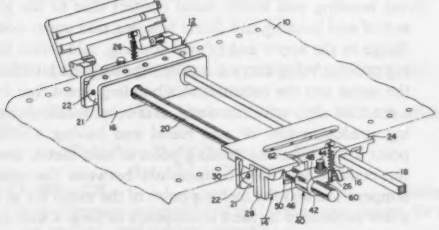
---

**4,129,239**

## CLAMPING DEVICES FOR DOCUMENT TRACTORS

**Leo J. Hubbard, Somerset, Mass., assignor to Precision Handling Devices, Inc., Assonet, Mass.**

**Filed Aug. 10, 1977, Ser. No. 823,370**
**Int. Cl.[2] B65H *17/34***
**U.S. Cl. 226—75** **16 Claims**



1. In a web feeding device having a frame and endless belt carrying drive elements engageable with perforations in the web, said belt being mounted on the frame, a sprocket also mounted in the frame driving in engagement with said belt and around which the belt is driven, said sprocket having an axle for receiving a drive shaft and said frame having an opening for receiving a support shaft which is parallel to said drive shaft, said frame being movable axially of said shafts to adjust the position of said belt to bring said drive elements into registry with the web perforation, a mechanism which enables said frame to be adjustably positioned on said shafts and which clamps said frame in position, said mechanism comprising only a pair of operational parts, a first of said parts having a split ring portion which encompasses said support shaft, means in said frame encompassing the opening which receives said support shaft for receiving said first part and providing a floating connection between said first part and said frame, and a second of said parts being mounted on said first part rotatable within said split ring portion for closing said split ring and bringing said split ring into clamping engagement with said support shaft.

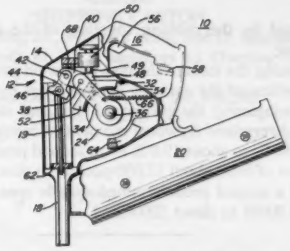
---

**4,129,240**

## ELECTRIC NAILER

**Bernard W. Geist, Melrose Park, Ill., assignor to Duo-Fast Corporation, Franklin Park, Ill.**

**Filed Jul. 5, 1977, Ser. No. 813,080**
**Int. Cl.[2] B25C *1/06***
**U.S. Cl. 227—8** **27 Claims**



1. An impact tool for applying a driving force to a fastener for driving said fastener into a workpiece, said tool comprising:

a tool housing;

a driver reciprocally mounted in said housing for driving said fastener;

at least one high speed, rotational energy device rotatably mounted in said housing and spaced from said driver;

means for rotating said energy device;

means for transferring said rotational energy of said energy device to said driver, said transferring means including a toggle mounted in said housing and movable from a first nonenergy transferring position to a second position coupling said energy device with said driver for transferring said energy to said driver thereby moving said driver into driving engagement with said fastener; and

means for moving said toggle into said first and second positions.

---

**4,129,241**

## INERTIA WELDING PROCESS FOR MAKING AN ANODE ASSEMBLY

**Thomas M. Devine, Jr., Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Apr. 18, 1977, Ser. No. 788,247**
**Int. Cl.[2] B23K *21/00***
**U.S. Cl. 228—113** **12 Claims**

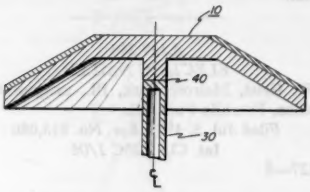
1. A method for affixing a stem to a disc which includes an x-ray target affixed to a selected surface area of a substrate to make an anode assembly for a rotating x-ray anode tube comprising

(a) placing the disc, wherein the substrate comprises a material which is one selected from the group consisting of molybdenum and molybdenum-based alloys, and the stem, which comprises a material which is one selected from the group consisting of columbium, columbium 291, columbium 103, and columbium-1Zr, to be joined together in inertia welding apparatus whereby the respective surface

areas thereof to be inertia welded together are in abutting relationship with each other;

(b) subjecting the positioned disc and stem to a first predetermined flywheel moment of inertia of from about 9.0 lb-ft$^2$ to about 19 lb-ft$^2$, a predetermined first axial force of from 3,100 pounds to about 4,500 pounds and a predetermined first spindle speed of from about 4,000 RPM to 4,800 RPM to cause the abutting surface to rub against each other;

(c) heating at least the substrate of the disc to a predetermined elevated temperature by the frictional energy generated by the rubbing together of the abutting surface areas;




(d) joining the stem to the disc by a weld joint formed at the interface of the abutting surface areas by inertia welding by subjecting the positioned disc and stem to a second predetermined flywheel moment of inertia of from about 9.0 lb-ft$^2$ to about 19.0 lb-ft$^2$, a second predetermined axial force of from about 11,000 pounds to about 13,250 pounds and a second predetermined spindle speed of from about 250 RPM to about 500 RPM.

---

**4,129,242**

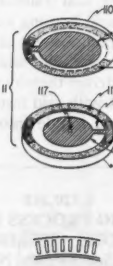
## HIGH FIDELITY PRESSURE TRANSDUCER

**J. Fleming Dias; Henry E. Karrer, both of Palo Alto, Calif., and Alexander Tykulsky, Carlisle, Mass., assignors to Hewlett-Packard Company, Palo Alto, Calif.**

**Division of Ser. No. 668,760, Mar. 22, 1976, Pat. No. 4,064,550. This application May 18, 1977, Ser. No. 797,978**

**Int. Cl.$^2$ B23K *1/04***

**U.S. Cl. 228—121** **8 Claims**






1. A method for brazing the quartz parts of a structure comprising the steps of:

disposing a segmented band of eutectic alloy on one surface of the first part;

disposing a correspondingly segmented band of eutectic alloy on one surface of the second part;

mating the bands of alloy of the first and second parts to form the structure;

applying a mating force along a line corresponding to the mated bands of alloy;

heating the structure to approximately 200° C. for less than an hour;

gradually increasing the heat applied to the structure approximately 260° C. for less than one additional hour; and

gradually cooling the structure to room temperature.

5. A brazed quartz structure comprising:

a first part having a segmented band of eutectic alloy disposed on one surface; and

a second part having a correspondingly segmented band of eutectic alloy disposed on one surface for mating with the band of alloy on one surface of the first part;

said segmented bands of alloy being fused together for effecting a substantially uniform clamping of the first part to the second part and for reducing thermal stresses in the first and second parts.

---

**4,129,243**

## DOUBLE SIDE COOLED, PRESSURE MOUNTED SEMICONDUCTOR PACKAGE AND PROCESS FOR THE MANUFACTURE THEREOF

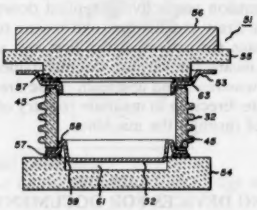
**Dominic A. Cusano, Schenectady; James A. Loughran, Scotia, and Yen S. E. Sun, Liverpool, all of N.Y., assignors to General Electric Company, Auburn, N.Y.**

**Continuation-in-part of Ser. No. 600,300, Jul. 30, 1975, Pat. No. 3,994,430. This application Jun. 17, 1976, Ser. No. 696,899**

**The portion of the term of this patent subsequent to Nov. 30, 1993, has been disclaimed.**

**Int. Cl.$^2$ H01L *23/02***

**U.S. Cl. 228—122** **18 Claims**




1. A method of manufacturing a double side cooled pressure mounted semiconductor package comprising the steps of:

providing an annular ceramic housing;

providing a metal lower contact disc and a metal upper contact flange;

direct bonding said lower metal contact disc to the lower end of said housing and direct bonding said upper contact flange to the upper end of said housing, said direct bonding process being carried out by exposing the interface of the metal and the ceramics to a bonding agent that forms a eutectic alloy with the metal, said eutectic alloy consisting predominately of said metal and having a melting point lower than the melting point of said metal, heating the combination to a temperature between the eutectic temperature and the melting point of the metal for at least a few seconds in an inert atmosphere to form a melt at the interfaces between said metal contact disc, the metal contact flange and said ceramic housing, wherein said steps of exposing and heating are carried out such that said melt is at least ultimately hypoeutectic, and cooling the combination;

positioning a semiconductor pellet subassembly in said housing;

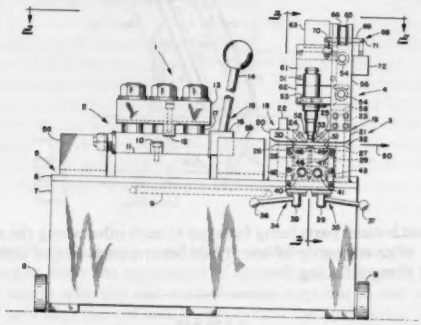
positioning an upper metal contact disc on said flange so as to close said package; and

welding said upper contact disc and said flange around their peripheries so as to seal said package.

## 4,129,244
## STRIP SHEARING AND JOINING METHOD AND APPARATUS

**Terrence P. Morris, Bedford Heights, Ohio, assignor to Guild International, Inc., Ohio**

**Continuation of Ser. No. 630,263, Nov. 10, 1975, abandoned. This application Apr. 6, 1977, Ser. No. 785,237**
**Int. Cl.² B23K 9/02**
**U.S. Cl. 228—170** **6 Claims**



1. A strip clamping and joining apparatus, comprising:
a frame bed for passage of strip material thereover,
joining means mounted with respect to said frame bed for joining the trailing end of one strip to the leading end of another strip,
first and second clamping means mounted on said frame bed, respectively, for clamping the strips in relative fixed position,
and means for automatically moving said joining means during operation of the latter to join such strip ends, said means for automatically moving comprising motor means for producing a mechanical output, drive means driven by said motor means for providing linear motion in a direction substantially parallel to the linear extent of the aligned clamped strip ends, carriage means for moving said joining means relative to such aligned clamped strip ends to join the same, and means for coupling said drive means and said carriage means, whereby said drive means may move said carriage means upon being connected thereto by said means for coupling, said drive means comprising a belt continuously driven by said motor means, and said means for coupling said drive means and said carriage means comprising a clamping arm on said carriage means, and means for moving said clamping arm into and out of clamping engagement with said belt.

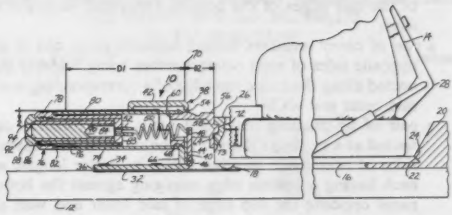
---

## 4,129,245
## ACCELERATION COMPENSATED DEVICE FOR SKI BINDINGS

**Duane J. Bonvallet, 605 S. Hickory Ridge Rd., Milford, Mich. 48042**

**Filed Jun. 30, 1977, Ser. No. 811,552**
**Int. Cl.² A63C 9/08**
**U.S. Cl. 280—628** **7 Claims**

1. An acceleration compensated ski boot release device for a safety ski binding, said device comprising:
a support member adapted to be mounted to a ski;
a pivot member having a first portion adapted to engage a portion of said ski boot, said pivot member being pivotally carried by said support member for movement about a pivot point such that said first portion is disposed on one side of said pivot point;
a mass;
means connecting said mass to said pivot member such that said mass and said pivot member pivots about said pivot point as a rigid unit and such that the center of gravity of said mass is disposed on the other side of said pivot point, said mass being so sized and located as to generate a moment at the pivot point equal to and opposite to a moment



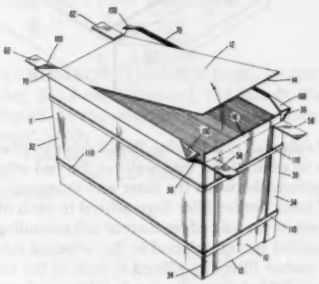
generated by the boot mass during acceleration of said boot to cancel the internal acceleration forces generated by said boot mass.

---

## 4,129,246
## SHIPPING CARTON

**Rudolph B. Rustia, Jr., Wilson's Mills, and O. Sherman Bales, Smithfield, both of N.C., assignors to Overton Company, Kenly, N.C.**

**Filed Oct. 28, 1977, Ser. No. 846,342**
**Int. Cl.² B65D 13/00**
**U.S. Cl. 229—23 R** **12 Claims**



1. A regular hexahedron shipping carton formed by six panels having recloseable means for access to said carton by at least one of said panels, comprising:
(a) four panels forming the regular hexahedron with open sides, at least one of said four panels having one unattached end forming an access panel;
(b) two side panels for closing the open sides; and
(c) means integral with each side panel at the perimeter thereof for engaging the adjacent surfaces of said four panels, said engaging means including tucking means for frictionally and releasably securing said access panel and for permitting opening and reclosing said access panel without disassembly of said carton, said engaging and tucking means being the sole means necessary for securing said access panel in closed position.

---

## 4,129,247
## DIE-CUT CARTON WITH BUILT-IN FILLERS

**Richard J. McCall, 1515 N. Sedgwick St., Chicago, Ill. 60610**

**Filed Sep. 30, 1977, Ser. No. 838,245**
**Int. Cl.² B65D 5/22, 5/24**
**U.S. Cl. 229—36** **1 Claim**

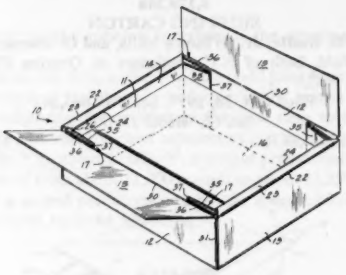
1. A carton die-cut and -scored from a one-piece corrugated sheet stock having a thickness, the carton comprising:
a rectangular bottom panel having a length and width defined by pairs of side and end edges;
a pair of up-standing side walls having a height and each

having opposite end edges and foldably connected to each of the side edges of the bottom panel;

a pair of up-standing outer end walls each connected to one of the end edges of the bottom panel and having a top edge;

a pair of cover members having opposite sides, one of said opposite sides of each cover member being foldably connected along the entire top edge of a corresponding one of said outer end walls;

a pair of up-standing inner end walls each foldably connected at a top edge thereof to the other of said opposite sides of said cover member along its entire length, and each having a bottom edge engaging against the bottom panel opposite the top edge of said inner end wall and having opposite side edges thereby forming a rectangular plane normal to said bottom panel which is defined by said width of said bottom panel and the height of said side walls such that a dimension measured perpendicular to and between said pair of inner end walls remains constant along the entire height of said side walls;



a pair of side wall end locking flaps foldably affixed at right angles to each of the side walls at the end edges thereof and received between the inner and outer end walls;

a pair of inner corner filler flaps affixed to each of the inner end walls at the side edges thereof and extending in generally parallel spaced relation to the adjacent side walls;

an outer corner filler flap affixed to each of the inner corner flaps and folded generally parallel thereto, facially engaging between the inner flap and adjacent side wall, and having an opposite side edge; and

four inner end wall locking flaps each affixed at substantially a right angle to the opposite side edge of one of the outer corner flaps and received between the adjacent side wall end locking flap and the inner end wall,

whereby to provide an integral filler at each corner of the carton which is properly placed and erected and remains in place adjacent a side wall without need of extrinsic fastening means upon assembly of the carton.

---

**4,129,248**

## FOLDING BOX FOR CONTAINING AND DISPLAYING ARTICLES SUCH AS FRUITS AND VEGETABLES

**Toni Casutt, Kirchweg 46, 8102 Oberengstringen, Switzerland**

**Filed Jun. 28, 1977, Ser. No. 810,740**

**Claims priority, application Switzerland, Jul. 6, 1976, 8664/76**

**Int. Cl.[2] B65D *5/36***

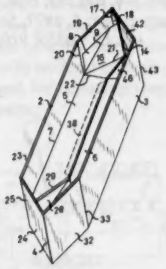
**U.S. Cl. 229—41 B** **8 Claims**

1. A folding box useful for holding and displaying articles such as fruits and vegetables, comprising in combination:

two first sidewalls (2,3) each having a bottom part (5,6) connected thereto through hinge-like bending lines (7);

two second sidewalls (24,32; 19,42) each having approximately in the middle thereof a hinge-like folding line for enabling the sides to be folded together, and

foldable connection flaps (8,16; 10,28; 12,34; 14,46) provided between at least one of the bottom parts (5,6) with which the flap is integral, and said second sidewalls (24,32; 19,42) in each case connected with the bottom part and a sidewall through hinge-like bending or folding lines (9,21; 11,28; 13,49; 15,48) and having an ear beyond one of said folding lines (9, 11, 13, 15) by which the flap is fastened in place,



said bottom parts being fastened to each other along the area of an edge strip of one of said bottom parts hinged thereto along a folding line.

---

**4,129,249**

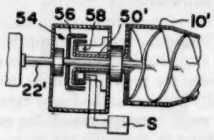
## CENTRIFUGE FOR SEPARATING SOLIDS AND LIQUIDS

**David B. Todd, Saginaw, Mich., assignor to Baker Perkins Inc., Saginaw, Mich.**

**Filed Aug. 17, 1977, Ser. No. 825,258**

**Int. Cl.[2] B04B *1/20, 9/10***

**U.S. Cl. 233—7** **4 Claims**




1. In a centrifuge for separating the liquid and solid components of a liquid-solid mixture, said centrifuge having a centrifuge bowl mounted for rotation about its axis, a helical conveying scroll mounted within said bowl for coaxial rotation relative to said bowl, and drive means for driving said bowl and said scroll in rotation at a speed differential relative to each other such that solids in said bowl are conveyed by said scroll to one end of said bowl; the improvement wherein said drive means comprises a power driven input shaft directly connected to said scroll for driving said scroll in rotation and for imparting rotation to said bowl via the frictional drag exerted on said bowl by the liquid-solid mixture in said bowl driven in rotation by said scroll, and control means for transmitting a selected component of the rotary torque of said shaft to said bowl to adjust the rotary speed of said bowl relative to said scroll.

---

**4,129,250**

## RELATIVE HUMIDITY CONTROL

**Malcolm Chaikin, Centennial Park, and Mstislav S. Nossar, Peakhurst, both of Australia, assignors to Unisearch Limited, Australia**

**Filed Mar. 3, 1977, Ser. No. 774,014**

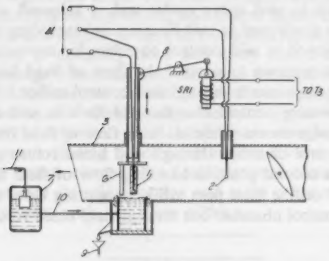
**Claims priority, application Australia, Mar. 2, 1976, PC5071**

**Int. Cl.[2] G05D *22/02***

**U.S. Cl. 236—44 A** **4 Claims**

1. Apparatus for measuring and controlling the relative humidity of exhaust air from an industrial drier including means for passing a sample of exhaust air from said drier past a dry bulb and a wet bulb thermocouple electric circuit means

for deriving a voltage providing a measure of the relative humidity of air in said sample from the said thermocouples, control means responsive to said voltage arranged to control the amount of exhaust air discharged from the drier to atmosphere, means to dip said wet bulb thermocouple cyclically in a container of water, a continuously cycling timer system



controlling the dipping of said wet bulb thermocouple and acting to delay the application of said voltage to the said control means whereby said control means responds to said voltage only after the wet bulb thermocouple has equilibrated with the exhaust air sample after dipping and to control the duration of operation of said control means.

---

**4,129,251**

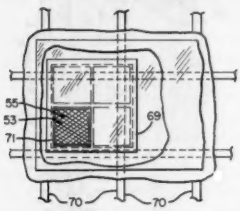
## HEAT EXTRACTOR FOR STOVES

**Claude W. Goldsby, P.O. Box 7646, Salem, Oreg. 97303, and Roray J. Sandau, Rte. 1, Box 729, Salem, Oreg. 97304**

**Division of Ser. No. 676,138, Apr. 12, 1976, Pat. No. 4,060,196. This application Oct. 20, 1977, Ser. No. 843,854**

**Int. Cl.[2] F24B 7/00**

**U.S. Cl. 237—51** **3 Claims**



1. In combination, a stove within a room having a floor supported by spaced-apart joists, the stove including a combustion chamber with an opening, an air intake manifold operatively connected to the combustion chamber, a combustion air supply duct which defines a hollow conduit having a top surface and an underside with an air intake opening therein, the conduit connected to a source of combustion air external to the room, wherein the improvement comprises:

an air intake port in the opening in the underside of the conduit, the port including a downwardly depending tubular mouth, the tubular mouth protruding downwardly through and below the underside of the conduit and through the room floor and upwardly through the underside of and within the conduit so that the upward projection of the mouth defines a sparkguard lip within the conduit, the air intake port is mounted on a substantially rectangular plate adjacent one corner thereof, the plate operatively connected to the underside of the conduit, the plate movable relative to the conduit's underside so that said port can be positioned to avoid the support joists in the room floor.

**4,129,252**

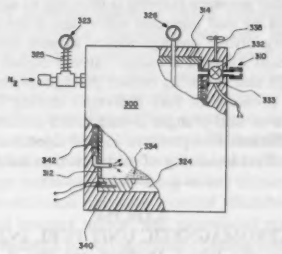
## METHOD AND APPARATUS FOR PRODUCTION OF SEEDING MATERIALS

**Andrew A. Pouring, U.S. Naval Academy, Annapolis, Md. 21402**

**Filed May 23, 1975, Ser. No. 580,372**

**Int. Cl.[2] A01G 15/00**

**U.S. Cl. 239—2 R** **5 Claims**



1. A method of generating ice nuclei comprising the steps of:

heating a vaporizable chemical compound in a closed insulated chamber to a point of vaporization;

pressurizing said chamber with an inert pressurization gas consisting essentially of $N_2$; and

controllably releasing the resulting gaseous mixture from said chamber through a hole in a thin metal sheet at supersonic flow into a moist atmosphere.

---

**4,129,253**

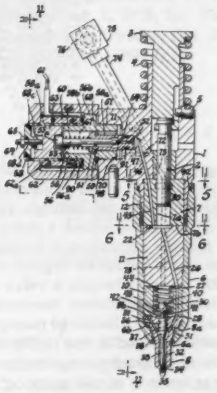
## ELECTROMAGNETIC UNIT FUEL INJECTOR

**Ernest Bader, Jr.; John I. Deckard, and Dan B. Kuiper, all of Grand Rapids, Mich., assignors to General Motors Corporation, Detroit, Mich.**

**Filed Sep. 12, 1977, Ser. No. 832,075**

**Int. Cl.[2] F02M 47/00**

**U.S. Cl. 239—88** **5 Claims**



1. An electromagnetic unit fuel injector including a housing means having a fuel inlet and a fuel drain outlet at one end thereof and including a spray tip valve body means terminating in a spray outlet at its other end, a pump cylinder in said housing means, a plunger reciprocable in said cylinder, said cylinder being open at one end for the ingress and egress of fuel during reciprocation of said plunger, a valve controlled inlet pasage means in said housing means connecting said inlet to said open end of said cylinder, discharge passage means in communication with said open end of said cylinder, said discharge passage means including an injection fuel delivery passage that terminates at said spray outlet, an injection valve movably positioned in said delivery passage and having one

end thereof normally positioned to close said spray outlet and, conduit means including a metering orifice passage means in fluid flow communication at one end with said discharge passage means and said open end of said cylinder and at its opposite end with said fuel drain outlet and, a normally open solenoid valve operatively positioned to control flow through said metering orifice passage means to said fuel drain outlet whereby, during a pump stroke of said plunger, fuel discharged under pressure thereby is directed to said spray outlet as controlled by said injection valve and is throttled through said metering orifice passage means to said fuel drain outlet and, when said solenoid actuated valve is closed to block fluid flow through said metering orifice passage means to said drain outlet, the pressure of fuel delivered during the continued pump stroke of said plunger is intensified sufficiently so as to build up sufficient fuel pressure in said injection fuel delivery passage to effect unseating of said injection valve.

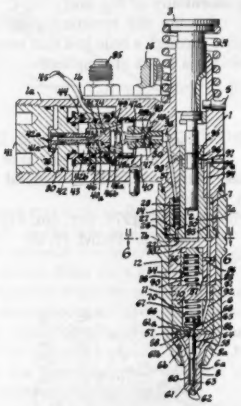
---

**4,129,254**

## ELECTROMAGNETIC UNIT FUEL INJECTOR

**Ernest Bader, Jr.; John I. Deckard, and Dan B. Kuiper, all of Grand Rapids, Mich., assignors to General Motors Corporation, Detroit, Mich.**

**Filed Sep. 12, 1977, Ser. No. 832,073**
**Int. Cl.² F02M *47/02, 55/00***
**U.S. Cl. 239—96** **5 Claims**



1. An electromagnetic unit fuel injector including a housing means having a fuel inlet and a fuel drain outlet adjacent one end thereof, said housing means including a valve body terminating in a spray outlet at its other end, a pump cylinder in said housing means, a plunger reciprocable in said cylinder, said cylinder being open at one end for the ingress and egress of fuel during reciprocation of said plunger, a valve controlled inlet passage means in said housing means connecting said inlet to said open end of said cylinder, discharge passage means including a one-way valve connected at one end to said open end of said cylinder, a control pressure passage means in said housing means terminating at one end at said spray outlet, an injection valve slidably positioned in said valve body in position to close said spray outlet, a pressure control chamber in said housing means, said pressure control chamber having a control orifice inlet port connected to said discharge passage means downstream of said one-way valve, an outlet in communication with said control pressure passage means and, a bleed return passage means, including a bleed orifice positioned opposite and in line with said control orifice inlet port, in communication with said fuel drain outlet, a pressure accumulator chamber in said housing means, a piston reciprocable in said pressure accumulator chamber, passage means connecting said discharge passage means, downstream of said one-way valve, to one end of said pressure accumulator chamber, drain passage means connecting the opposite end of said pressure accumulator chamber to said fuel drain outlet, a spring positioned in said pressure accumulator chamber to normally bias said piston toward the end of said pressure accumulator chamber in communication with said discharge passage means, a spring cage chamber in said housing means in fluid communication with said opposite end of said pressure accumulator chamber, spring means in said spring cage chamber operatively abutting against said injection valve to normally bias said injection valve into closing engagement relative to said spray outlet and, a solenoid actuated valve means positioned in said housing and including a valve means positioned in said control chamber for movement between a first position to control the flow of fluid from said discharge passage means through said control orifice inlet port into said pressure control chamber for flow to said control pressure passage means while blocking flow of fluid from said pressure control chamber through said bleed return passage means and a second position blocking flow of fluid through said control orifice inlet port while permitting flow of fluid from said control chamber out through said bleed return passage means.

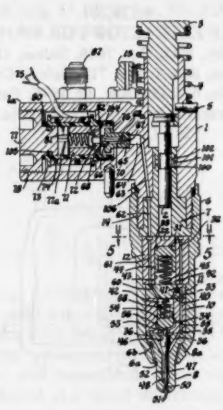
---

**4,129,255**

## ELECTROMAGNETIC UNIT FUEL INJECTOR

**Ernest Bader, Jr.; John I. Deckard, and Dan B. Kuiper, all of Grand Rapids, Mich., assignors to General Motors Corporation, Detroit, Mich.**

**Filed Sep. 12, 1977, Ser. No. 832,085**
**Int. Cl.² F02M *47/02, 55/00***
**U.S. Cl. 239—96** **5 Claims**



1. An electromagnetic unit fuel injector-pump assembly including a housing means having a fuel inlet and a fuel drain outlet at one end thereof and including a valve body terminating in a spray outlet at its other end, a pump cylinder in said housing means, a plunger reciprocable in said cylinder, said cylinder being open at one end for the ingress and egress of fuel during reciprocation of said plunger, a valve controlled inlet passage means in said housing means connecting said inlet to said open end of said cylinder, discharge passage means connected at one end to said open end of said cylinder, a one-way valve in said discharge passage means adjacent said one end thereof, an injection fuel delivery passage connected at one end to said valve controlled discharge passage means and terminating at its other end at said spray outlet, an injection valve in said delivery passage having one end thereof in position to close said spray outlet, a pressure accumulator chamber in said housing means, a first piston reciprocal in said pressure accumulator chamber, conduit means connecting said discharge passage means to one end of said pressure accumulator chamber, drain passage means in said housing means connected at one end to said drain outlet, drain conduit means connecting

the opposite end of said pressure accumulator chamber to said drain passage means, spring means in said pressure accumulator chamber normally biasing said first piston toward said end of said pressure accumulator chamber in communication with said outlet passage means, a pressure chamber in said housing means, said injection valve having its other end thereof projecting into said pressure chamber, a second piston reciprocable in said pressure chamber, a rate spring means in said pressure chamber normally biasing said second piston into engagement with said injection valve to move said injection valve in a direction to normally close said spray outlet, a throttling orifice passage connecting said discharge passage means to said pressure chamber on the side thereof containing said rate spring means, said drain passage means being in communication with the opposite end of said pressure chamber and, conduit means including a solenoid actuated valve controlled metering orifice connected to said pressure chamber downstream of said throttling orifice and at its other end in fluid communication with said drain outlet.

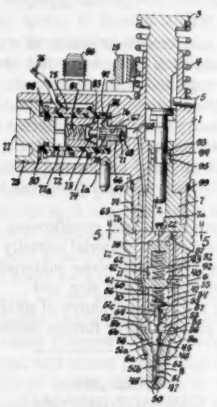
---

**4,129,256**

## ELECTROMAGNETIC UNIT FUEL INJECTOR

**Ernest Bader, Jr.; John I. Deckard, and Dan B. Kuiper, all of Grand Rapids, Mich., assignors to General Motors Corporation, Detroit, Mich.**

**Filed Sep. 12, 1977, Ser. No. 832,074**
**Int. Cl.[2] F02M *47/02, 55/00***
**U.S. Cl. 239—96** **5 Claims**



1. An electromagnetic unit fuel injector - pump assembly including a housing means having a fuel inlet and a fuel drain outlet at one end thereof, said housing means at its other end including a valve body having a spray outlet at its free end, a pump bushing in said housing means, a plunger reciprocable in said bushing, said bushing being open at one end for the ingress and egress of fuel during reciprocation of said plunger, a valve controlled inlet passage means in said housing means connecting said inlet to said open end of said bushing, discharge passage means including a one-way valve connected at one end to said open end of said bushing and in communication at its other end with said spray outlet, an injection valve slidably journaled in said housing means to control flow out through said spray outlet, a pressure accumulator chamber in said housing means, an accumulator piston reciprocably positioned in said pressure accumulator chamber, passage means connecting said discharge passage means to one end of said pressure accumulator chamber, drain passage means in said housing means connected at one end to said drain outlet and at its other end to the opposite end of said pressure accumulator chamber, a spring in said pressure accumulator chamber normally biasing said accumulator piston toward said end of said pressure accumulator chamber in communication with said discharge passage means, a spring cage chamber in said housing means in fluid communication at one end with said discharge passage means, a modulation pressure control chamber in said housing means positioned between said spring cage chamber and said spray outlet, a guide bore in said housing means extending between said spring cage chamber and said modulation pressure chamber, said injection valve having a piston portion reciprocally journaled in said guide bore with one end thereof extending into said modulation pressure chamber and a reduced diameter extension portion thereof extending into said spring cage chamber, spring means in said spring cage chamber abutting against said extension portion of said injection valve whereby to bias said injection valve into closing engagement relative to said spray outlet, a throttling orifice passage in said housing means connecting said spring chamber in fluid communication with said modulating pressure control chamber, a modulated pressure passage means in said housing means connected at one end to said modulation pressure control chamber, a drain chamber in said housing means, said modulated pressure passage means including a metering orifice opening into said drain chamber, solenoid actuated valve means including a valve positioned to control the flow of fluid through said metering orifice into said drain chamber and, drain passage means connecting said drain chamber to said fuel drain outlet.

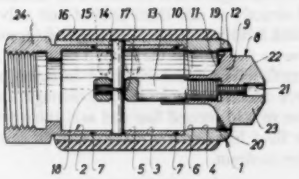
---

**4,129,257**

## JET MOUTH PIECE

**Uwe Eggert, Fyrkloversgatan 68, 417 21 Goteborg, Sweden**

**Continuation of Ser. No. 515,609, Oct. 17, 1974, abandoned.**
**This application Dec. 2, 1976, Ser. No. 746,895**
**Claims priority, application Sweden, Oct. 23, 1973, 7314346**
**Int. Cl.[2] B05B *1/32***
**U.S. Cl. 239—458** **2 Claims**

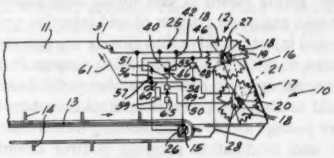


1. A nozzle intended for a jet-pipe working with a pressurized liquid, said nozzle comprising a throttle valve head, a longitudinal shaft extending in a countercurrent direction, having a lateral opening and being adjustably connected to said valve head, a pair of sleeves being rotatably journalled on each other, one of said sleeves being an orifice sleeve surrounding said valve head and having a guide slot, the other of said sleeves having a pair of opposed openings with one of said opening communicating with said guide slot, a transverse shaft extending through said longitudinal shaft lateral lateral opening, means for pivotally supporting said longitudinal shaft on said transverse shaft for swingable movement in any direction, said transverse shaft also extending through said other sleeve openings into said orifice sleeve guide slot, and said guide slot having a pitch such as to give said orifice sleeve a positively controlled axial movement upon the rotation of said orifice sleeve.

## 4,129,258
## AUTOMATIC HYDRAULIC SERIES-PARALLEL SHIFT DEVICE FOR IMPLEMENT

**Richard H. Mott, and Clyde L. Pritchard, both of Sioux Falls, S. Dak., assignors to Du-Al Manufacturing Company, Sioux Falls, S. Dak.**

**Filed Jan. 31, 1977, Ser. No. 764,444**
**Int. Cl.[2] A01C *3/06***
**U.S. Cl. 239—650** **17 Claims**



1. An hydraulically operated manure spreader comprising:
a hopper having a rearward end;
an upper and a lower flinger assembly each journalled in and extending horizontally across said rearward end of the hopper and having transversely-extending arm means for shredding and throwing piled material rearwardly and outwardly of the hopper;
first and second hydraulic motors each arranged for each rotatably driving one of said upper and lower flinger assemblies and each having a fluid inlet and a fluid outlet;
a source of pressurized fluid; and
hydraulic circuit means on said hopper for selectively driving each of said first and second hydraulic motors in series at high speed or in parallel at lower speed and higher torque from said source of pressurized fluid, said hydraulic circuit means comprising
a valve having first through fourth ports and an actuatable internal means for selectively blocking said ports and for connecting said first and second ports together and said third and fourth ports together depending on fluid pressure at said first port,
a first fluid line communicating the source of pressurized fluid to said first port of said valve and to said inlet of said first motor,
a second fluid line communicating the outlet of the first motor through a first check valve to a third fluid line and directly to said third port of said valve;
said third fluid line communicating said second port of the valve to the inlet of the second motor,
a fourth fluid line communicating the outlet of said second motor selectively to a load and through a second check valve to said second line and said third port, and
a fifth fluid line communicating said fourth port of said valve to drain.

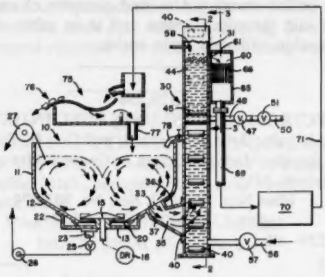
---

## 4,129,259
## APPARATUS FOR PULPING WASTE PAPER MATERIALS

**Robert F. Vokes, Whispering Pines, N.C., assignor to The Black Clawson Company, Middletown, Ohio**

**Filed Sep. 15, 1977, Ser. No. 833,483**
**Int. Cl.[2] B02C *23/36***
**U.S. Cl. 241—20** **10 Claims**

8. The method of operating apparatus for recovering paper making fiber from waste paper products including substantial quantities of plastic film and other lightweight non-paper contaminants which comprises:
(a) a tub for receiving such waste paper products and water to at least a predetermined minimum level,
(b) a rotor mounted for rotation in said tub to pulp such waste paper products to aqueous slurry form,
(c) means for extracting from said tub a liquid suspension of small particles of less than a predetermined maximum size,
(d) an outlet in said tub bottom separate from said extracting means,
(e) junk removing means including a casing adjacent said tub and of at least the same height,
(f) a chute connecting said outlet with said casing and providing for liquid flow between said tub and said casing,
(g) an open tank supported in said casing above said maximum liquid level,
(h) means providing an overflow weir from said tank lower than the other walls of said tank and leading exteriorly of said casing, and
(i) conveyor means in said casing for collecting liquid and waste materials and depositing the same in said tank, which method comprises the steps of



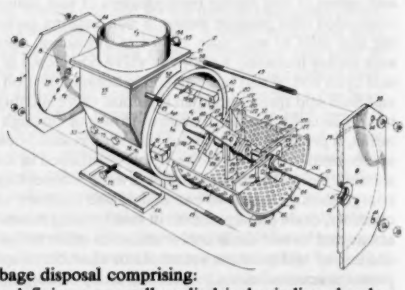
(i) operating said conveyor means at a rate sufficient to maintain said tank sufficiently full to overflow along said weir together with lightweight reject materials floating adjacent the top of the liquid in said tank and thereby to carry said floating materials exteriorly of said casing while minimizing flow of liquid over other walls of said tank into said casing and thereby reducing the liquid level in said casing with respect to the liquid level in said tub,
(ii) coarsely screening said overflowing slurry to deflect large pieces of waste material laterally therefrom while passing the liquid and waste materials smaller than a predetermined maximum size, and
(iii) recycling the resulting slurry of smaller waste materials to said pulper tub for further defibering.

---

## 4,129,260
## GARBAGE DISPOSAL

**Marlin J. Baker, 1039 Meadowbrook La., Conyers, Ga. 30207**

**Continuation-in-part of Ser. No. 716,582, Aug. 23, 1976, abandoned. This application Jun. 13, 1977, Ser. No. 805,820**
**Int. Cl.[2] B02C *13/04, 13/286***
**U.S. Cl. 241—46 A** **7 Claims**



1. A garbage disposal comprising:
a housing defining a generally cylindrical grinding chamber therein defining a central grinding axis therethrough, an inlet to said grinding chamber through which garbage can

be introduced into said grinding chamber, and an outlet from said grinding chamber from which the comminuted garbage is discharged from said grinding chamber;

a hammer assembly rotatably mounted by said housing within said grinding chamber about a rotational axis coinciding with the grinding axis, said hammer assembly including a drive shaft assembly rotatable about the grinding axis and a plurality of hammer cutters pivotally mounted on said drive shaft assembly about cutter pivot axes generally parallel to and spaced outboard of the grinding axis, said hammer cutters rotated with said drive shaft assembly in cutting planes generally normal to the grinding axis, each of said hammer cutters rotating in a separate cutting plane axially spaced along said support shaft assembly from the cutting planes of the other of said hammer cutters, each of said hammer cutters having a longitudinal centerline, an outboard end surface opposite the pivotal connection between said hammer cutter and said drive shaft assembly oriented normal to the longitudinal centerline, and opposed leading and trailing side edge surfaces joining opposite ends of the end surface and defining outboard leading and trailing sharp corners at the junction of the end surface and side edge surfaces of said hammer cutter, each of said hammer cutters pivotal with respect to said drive shaft assembly about the cutter pivot axis so that the centrifugal force on said hammer cutter keeps it generally radial with respect to the grinding axis so that the outboard leading and trailing sharp corners of said hammer cutter is located a first prescribed radial distance from the grinding axis;

a screen assembly carried by said housing within said grinding chamber, separating said inlet from said outlet in said grinding chamber, and cooperating with said hammer assembly to comminute the garbage, said screen assembly including, an arcuate screen plate and screen positioning means for locating said screen plate in said grinding chamber, said arcuate screen plate defining a plurality of grinding holes therethrough of a diameter at least as small as the largest piece of comminuted garbage to pass from said outlet from said grinding chamber and further defining a sharp corner about each of said grinding holes at the inside surface of said screen plate, said screen plate having a prescribed inside radius slightly greater than said first prescribed radial distance of the sharp corners on said hammer cutter, said screen positioning means locating the inside surface of said screen plate so that its radius of curvature coincides with the grinding axis and the inside surface is concentric about the grinding axis, said screen positioning means further locating the inside surface of said screen plate sufficiently close to the sharp corners of said hammer cutters so that the leading sharp corner of each of said hammer cutters forces the garbage into the grinding holes in said screen plate and shears the garbage between the leading corner of said hammer cutter and the grinding holes in said screen plate to comminute the garbage and so that the outboard end surface of said hammer cutter allows the garbage to expand after passage of the leading corner of said hammer cutter while maintaining cutting contact of the garbage immediately outboard of the outboard end surface of said hammer cutter and the grinding holes in said screen plate to prevent wedging; and,

a leading breaker bar mounted inside said grinding chamber at the leading end of said screen plate and longitudinally oriented generally parallel to the grinding axis, said leading breaker bar located to cooperate with said hammer cutter to preliminarily break large pieces of the garbage into smaller pieces so that these smaller pieces can be comminuted between said hammer cutters and said screen plate.

**4,129,261**

## AGITATING MILL

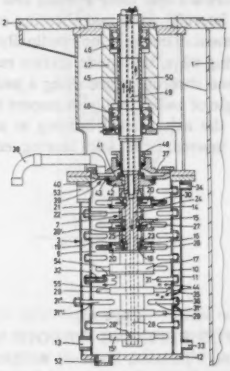
**Kaspar Engels, Mannheim, and Karlheinz Wilhelm, Bobstadt, both of Germany, assignors to Draiswerke GmbH, Mannheim-Waldhof, Germany**

**Filed Jun. 29, 1977, Ser. No. 811,184**

**Claims priority, application Fed. Rep. of Germany, Jun. 30, 1976, 2629251**

**Int. Cl.[2] B02C *17/16***

**U.S. Cl. 241—46.11** **10 Claims**



1. In an agitating mill with a cylindrical grinding container defining a grinding space, and with a rotatable drivable mixer mounted concentrically therein, the mixer including a hollow mixing shaft having an axis and mixing bars projecting substantially radially with respect to said axis into said grinding space, the container having a grinding stock inlet means and ground-stock outlet means, the improvement comprising radially projecting discs mounted on said hollow mixing shaft, said mixing bars being fastened to said discs; and a grinding media partially filling said grinding space.

---

**4,129,262**

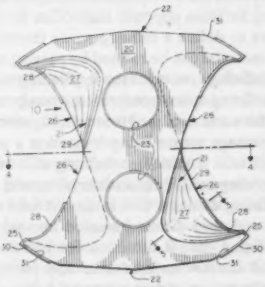
## PULVERIZER HAMMER FOR COMMINUTATING APPARATUS

**John A. Lowry, Columbus, Ohio, assignor to E & I Corporation, Columbus, Ohio**

**Filed Aug. 12, 1977, Ser. No. 823,958**

**Int. Cl.[2] B02C *13/28***

**U.S. Cl. 241—197** **17 Claims**



1. A pulverizer hammer comprising

(A) an elongated body portion having a longitudinal axis and a shaft receiving bearing extending transversely therethrough at one end, and

(B) a head portion formed with said body portion in relatively remote relationship to said bearing and including

(1) an elongated, transversely extending tearing edge projecting in a generally lateral direction to said longitudinal axis,

(2) a longitudinally extending shearing edge extending in receding relationship to said tearing edge in a direction inwardly relative to said tearing edge, and

(3) a material guide surface extending in receding relationship from said tearing edge in a direction inwardly thereof toward said body portion and in receding relationship laterally from said shearing edge for inducing displacement of material longitudinally outward toward said tearing edge, said guide surface receding from said tearing and shearing edges along a path having a maximum angle of inclination with respect to a plane passing through the axis of said bearing at a point displaced radially inward from said tearing edge toward said bearing.

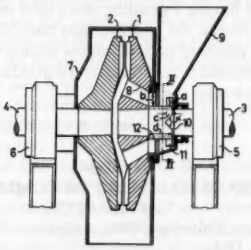
---

**4,129,263**

**DEVICE FOR REFINING FIBROUS MATERIAL**

**Axel H. Sjobom, Njurunda, Sweden, assignor to Sunds Aktiebolag, Sundsvall, Sweden**

**Filed Aug. 31, 1977, Ser. No. 829,452**
**Claims priority, application Sweden, Sep. 9, 1976, 7609973**
**Int. Cl.[2] B02C *7/11***
**U.S. Cl. 241—248** **14 Claims**



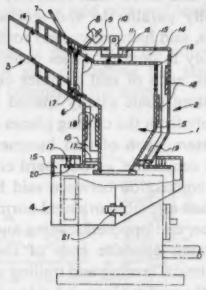
1. Apparatus for refining fibrous material which comprises first and second refining discs, said refining discs including an inner refining surface and an outer surface, said refining discs mounted on shafts for rotation relative to each other with said inner refining surfaces opposite each other during said relative rotation so as to define a refining space therebetween, so that said fibrous material can be refined by passing radially outward within said refining space, means for feeding said fibrous material to said refining space comprising passage means extending from the outer surface of said first refining disc to said refining space, said passage means being located at a point adjacent to said shaft on which said first refining disc is mounted, feed means for feeding said fibrous material to said outer surface of said first refining disc at a first rate, said feed means including a discharge end, and means mounted on said shaft on which said first refining disc is mounted for rotation therewith for injecting said fibrous material into said passage means at an increased velocity as compared to said first rate, said means mounted on said shaft on which said first refining disc is mounted being located at a point spaced from said outer surface of said first refining disc and said discharge end of said feed means being located between said means mounted on said shaft and said passage means.

**4,129,264**

**SOUNDPROOF HOPPER**

**Semyon Lanin, 330 Wadsworth Ave., Apt. 6F, New York, N.Y. 10040, and Jackob Lanin, 288 Dunhams Corner Rd., East Brunswick, N.J. 08816**

**Filed Sep. 14, 1977, Ser. No. 833,310**
**Int. Cl.[2] B02C *23/00*; G10K *11/04***
**U.S. Cl. 241—285 R** **8 Claims**



1. A soundproof hooper for a machine for comminuting material comprising an inner hopper mounted on said comminuting machine, an outer hopper enclosing said inner hopper, means for loosely supporting said outer hopper on said inner hopper so that said outer hopper is free to move with respect to said inner hopper and said comminuting machine, said means for loosely supporting said outer hopper including resilient material on which said outer hopper rests on said inner hopper and means for soundproofing said inner hopper located between said inner hopper and said outer hopper.

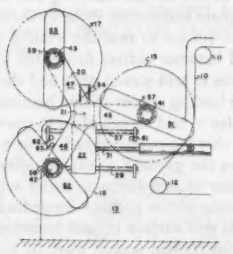
---

**4,129,265**

**REELED WEB UNWIND STAND**

**Clarence L. Bandy, Jr., Fayetteville, W. Va., assignor to Westvaco Corporation, New York, N.Y.**

**Filed Apr. 14, 1978, Ser. No. 896,171**
**Int. Cl.[2] B65H *19/12***
**U.S. Cl. 242—58.2** **7 Claims**

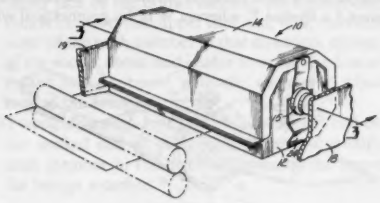


2. A reeled web material unwind stand having spider wheel means mounted for rotation about a spider axis, said wheel means comprising a plurality of spider arm means radiating from said axis, each of said arm means having axially elongated reel mandrels secured to distal ends thereof parallel with said spider axis, the improvement comprising shift carriage means supporting said spider wheel means for reciprocable planar movement of said spider axis.

## 4,129,266
## PAPER CASSETTE

Felix R. Masiello, Parsippany, N.J., assignor to Addressograph-Multigraph Corporation, Los Angeles, Calif.

Filed Jul. 21, 1977, Ser. No. 817,891
Int. Cl.[2] B65H *17/02*
U.S. Cl. 242—68.4 1 Claim



1. A supply cassette for precise alignment of a paper roll supply in a process machine; comprising:

a housing defined by walls including parallel end walls having external, axially aligned, hub means extending from said end walls for mounting the housing between support walls of the process machine, said hub means establishing an axis for the supported roll, and yieldable means positionable between one housing end wall and one support wall for urging the housing into a gauging relationship with the opposite support wall;

a central core axially aligned with said hub means for support of a supply roll;

the core having a first and second section:

said first core section having two portions, the first beginning at one end of the core and having an external surface dimensioned to support a supply roll, said first portion being of a length shorter than the minimum width roll to be supported, and the second portion being smaller in section configuration and extending to a plunger hub end piece, said hub end piece mounted by guide means to reciprocate along said axis, and a yieldable means urging the end piece to its extended limit, the length of said first core section being greater than the distance between said end walls when fully extended and shorter when fully retracted;

said second section being tubular and carried coaxially with said second portion of the first section in slidable relationship therewith;

yieldable means urging said second section toward the first portion of said first section of said core;

a shield for establishing a retaining space between one housing wall and the shield to confine a supply roll, and

means for securing said shield to the second section in any one of a plurality of possible longitudinal positions corresponding to s supply roll to be serviced;

whereby, said housing and the supply roll therein are gauged from one side of the machine being serviced.

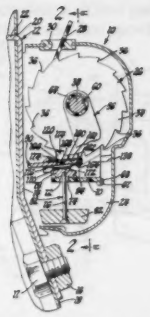
---

## 4,129,267
## ADJUSTING METHOD AND CLIP FOR RETRACTOR LOCK BAR

James C. Degras, St. Clair Shores, and David N. Lee, Almont, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 23, 1977, Ser. No. 809,193
Int. Cl.[2] A62B *35/02;* B65H *75/48*
U.S. Cl. 242—107.4 A 5 Claims

1. In a vehicle inertia responsive seat belt retractor having a housing, a belt reel rotatably mounted on the housing for winding and unwinding a seat belt, a lock bar for locking the reel against belt unwinding rotation and being pivotally mounted for movement between a locking position and an unlocking position, and an inertia responsive member mounted for movement in response to a predetermined level of inertia stimulus to operate the lock bar from the unlocking position to the locking position, the improvement comprising: an adjusting clip providing the operating connection between the inertia responsive member and the lock bar, said clip means being generally U-shaped with spaced apart legs defining a slot which receives the lock bar to retain the clip means on the lock bar, one of the legs of the clip means being disposed adjacent the inertia responsive member and having an integral nonyield-



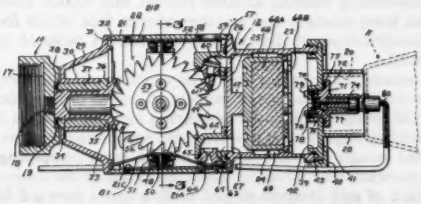
able protuberance extending therefrom and adapted to operatively engage the inertia sensing means, said integral protuberance of the clip means projecting from the leg a selected distance to poise the lock bar at an unlocking position at a selected distance from the reel to control the distance through which the lock bar must be moved from the unlocking position to the locking position.

---

## 4,129,268
## ROCKETS INCLUDING TRAJECTORY CONTROLS

Willis F. Tibbetts, Reading, Mass., assignor to Norris Industries, Inc., Los Angeles, Calif.

Filed Oct. 23, 1965, Ser. No. 503,838
Int. Cl.[2] F42B *13/30*
U.S. Cl. 244—3.22 10 Claims



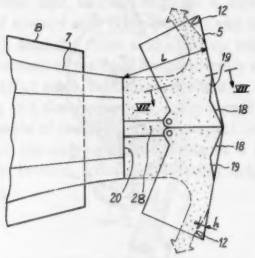
1. A rocket comprising a rear section including a motor, a forward war head section, an intermediate trajectory control section, and a rotatable connection between said control and motor sections, a gyroscope and a gas generator mounted within said control section, the generator ahead of the gyroscope, said gas generator including ignition means, a first nozzle operable to deliver a wheel-driving gas stream to the wheel of said gyroscope, and a second nozzle operable to deliver an upward thrust in assistance of the flight of said rocket, the thrust being applied approximately in the zone of the center of gravity of said rocket, means operable in response to a predetermined set-back force exerted on said rocket during its launch to engage and support said wheel against said force only during the existence of said force, gyroscope caging means, and means to release said caging means in response to the operation of said generator.

**4,129,269**

## SINGLE-SKIN THRUST REVERSER FOR AIRCRAFT JET ENGINES

**Etienne Fage, Jouy en Josas, France, assignor to Astech, Meudon la Foret, France**

**Filed Apr. 4, 1977, Ser. No. 784,562**
**Claims priority, application France, Apr. 14, 1976, 76 10968**
**Int. Cl.[2] B64C *15/06*; B64D *33/04***
**U.S. Cl. 244—110 B** **6 Claims**



1. A thrust reverser adapted for use with an aircraft jet engine having a jet exhaust pipe from which a jet of gaseous products emerges, said reverser comprising two symmetrical doors, each of which is at least substantially hemi-truncated in form, having opposed arcuate leading and trailing edges and opposed rectilinear side edges,

said doors being mounted to pivot about an axis adjacent said trailing edges, said axis being transverse and substantially diametrical with respect to the jet of said engine, and which is disposed downstream of the jet exhaust pipe thereof,

each of said doors comprising a thin wall having a concave inner face and a convex outer face, and

elongated reinforcing members attached to said concave face adjacent the arcuate leading and trailing edges and the rectilinear side edges thereof, said reinforcing members projecting inwardly from said concave face, at least half of said inner concave face being exposed to contact with said jet,

said wall having a crescent-shaped section at its rearward end, defined by the trailing edge of said wall and said reinforcing member adjacent thereto, said section having an inner concave and an outer convex face which form continuations of the concave and convex faces of said wall,

an arcuate lining having two faces which intersect to form a trough having an approximately V-shaped cross-section, said lining spanning the reinforcing member adjacent the trailing edge of said door with said reinforcing member in the trough of said lining, said lining faces comprising a rearward face covering substantially all of the concave face of said crescent-shaped section and a forward face covering less than half of the concave face of said wall,

each door being movable between a first, folded position in which said outer face forms an extension of a section of said aircraft, and a second, unfolded position in which said outer face is disposed transversely with respect to said jet.

---

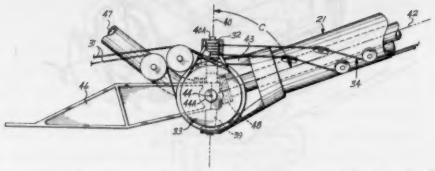
**4,129,270**

## AIR REFUELING BOOM PIVOT GIMBAL ARRANGEMENTS

**Ronald H. Robinson, Bellevue, and Richard H. Weiland, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.**

**Filed Jun. 13, 1977, Ser. No. 806,029**
**Int. Cl.[2] B64D *39/00***
**U.S. Cl. 244—135 A** **20 Claims**

1. Apparatus for attaching a boom to a supply airplane for the aerial transfer of material to a receiver airplane, comprising: a gimbal member mounted to support structure of the supply airplane for rotation about a transverse horizontal axis approximately parallel to the lateral axis of the supply airplane; said gimbal member connectably supporting the boom for lateral movement relative to the supply airplane about an azimuth axis, said azimuth axis being fixed at a predetermined angle less than 90° to the lengthwise axis of the boom; said boom gimballing arrangement providing a geometrical disconnect envelope from said receiver airplane as determined by $W=2 \cdot L \cdot \text{sine}(A+B) \cdot \text{sine } Y$, wherein W is the geometrical width



of said disconnect envelope, L is the length of said boom, A is the angle of inclination of said boom aximuth axis above a horizontal reference plane, B is the angle of elevation of said boom below said horizontal reference plane, and Y is the yaw angle of the boom about said azimuth axis; and means for moving the boom in elevation and canting the azimuth axis towards the horizontal from a vertical orientation with respect to the supply airplane to provide a boom rolling motion coupled with sideward movement thereof.

---

**4,129,271**

## AUTOMATIC HANGING AND WEDGING DEVICE FOR AIRCRAFT LOADS

**Jean H. Hasquenoph, Lagny-sur-Marne, and Pierre F. Coutin, Paris, both of France, assignors to R. Alkan & Cie, Valenton, France**

**Filed Apr. 14, 1977, Ser. No. 787,663**
**Claims priority, application France, Mar. 9, 1977, 77 06917**
**Int. Cl.[2] B64D *1/02***
**U.S. Cl. 244—137 R** **2 Claims**

1. In a device, for suspending a load from an aircraft having a support to be secured to the aircraft, a bridge member to be secured to the load, said bridge member having an abutment at an end thereof and an upper face and two opposed side faces, and a suspension hook pivotably mounted on the support and movable into a first position in which said hook is disengaged from the abutment of the bridge member, and a second position in which said hook is engaged under the abutment of the bridge member for suspension of the load from the support, the improvement for preventing lateral oscillation of the load when suspended from the support, said improvement comprising:

(i) first and second push members each having a first end and a second end, said push members being longitudinally slidable in said support towards and away from the upper face of the bridge member,

(ii) first and second sockets, the first socket being engaged by a ball and socket formation with a first end of the first push

member, the second socket being engaged by a ball and socket formation with a first end of the second push member, each socket including a first arm portion depending below the center of the ball and socket formation and a second arm extending laterally from said center towards the other push member, the push members and the sockets being positioned in relation to the bridge member such that, upon movement of each push member towards the upper face of the bridge member the second arm of each socket contacts said upper face and, with continued movement of the push member in that direction, causes pivoting of the socket about said center to move the first arm of the socket into abutment with the respective adjacent side face of the bridge member,

(iii) wedging means movable in said support and contacting the second end of each push member for shifting each push member in the direction towards the upper face of the bridge member.

---

**4,129,272**

## AEROFOIL STRUCTURE

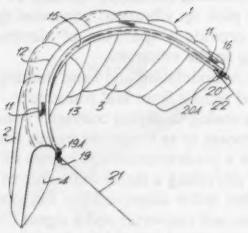
**Andrew W. Jones, 1 Cottage, Thriplow Farm, Thriplow, Near Royston, Herfordshire, and Raymond Merry, 29 Osborne Sq., Dagenham, Essex, both of England**

**Filed Aug. 19, 1977, Ser. No. 826,256**

**Claims priority, application United Kingdom, Aug. 23, 1976, 35024/76**

**Int. Cl.**[2] **B64C** *31/06;* **B64D** *17/02*

**U.S. Cl. 244—153 R** **5 Claims**



1. An aerofoil structure arranged for airborne flight under the influence of an air stream comprising an envelope of flexible light-weight material having leading and trailing edges with respect to air flow, the leading edge facing upstream in flight, said envelope having upper and lower surface members, a plurality of separator members between and joined to the surface members to divide the interior of the envelope into a plurality of elongate chambers, and an elongate opening along the leading edge between the surface members to permit the ingress of ram air to inflate the chambers, the separator members being shaped to cause the upper and lower surface members to assume an aerofoil section in the direction of flow of the air stream; an elongate spar positioned along the leading edge of the bottom surface member transverse the direction of air flow, the ends of the bottom surface member leading edge and the ends of the spar being arranged to form anchor points respectively and a pair of control lines, one secured respectively to each of said anchor points, the spar being sufficiently flexible to assume a degree of curvature when the structure is in flight.

---

**4,129,273**

## KITE CONTROL MECHANISM

**Donald R. Hill, 334 Huntington La., Elmhurst, Ill. 60126**

**Filed Aug. 9, 1977, Ser. No. 823,022**

**Int. Cl.**[2] **B64C** *31/06;* **B65H** *75/40*

**U.S. Cl. 244—155 A** **15 Claims**

1. A kite steering mechanism for controlling a plurality of kite-flying lines, said mechanism comprising:

a frame having spaced apart wall portions provided with coaxial journals;

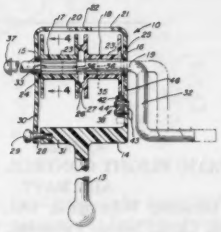
handle means on the frame;

a control shaft rotatably and axially movably carried coaxially in said journals;

a crank arm connected to said shaft for manual rotation of the shaft in said journals;

first and second spools rotatably mounted on said shaft between said wall portions; and

releasable means including a driver portion on said shaft, a first driven portion on said first spool and a second driven



portion on said second spool, said driver portion being selectively drivingly engageable with

(a) both said driven portions, and

(b) said first driven portion only as an incident of axial positioning of the control shaft, said releasable means including friction drive means on said spools for causing said second spool to be driven releasably with said first spool means when said driver portion is arranged to drive only said first driven portion on the first spool, and means for adjusting said friction drive means to provide an effective frictional interlock between said spools.

---

**4,129,274**

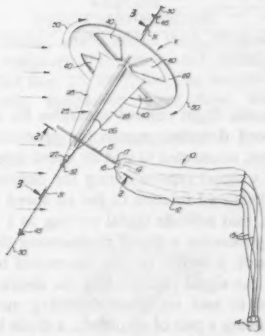
## KITE PARACHUTE LAUNCHER

**Joseph Baker, 1174 Bonita Dr., Colton, Calif. 92324**

**Filed Dec. 27, 1977, Ser. No. 864,877**

**Int. Cl.**[2] **A63H** *27/08*

**U.S. Cl. 244—155 R** **2 Claims**



2. A kite parachute launcher comprising:

a hollow stem adapted to be axially penetrated by and rotate freely about a section of a kite string and thus be supported close to the kite while the kite is being flown;

a series of at least four radial ribs approximately co-extensive in length and integrally united with said stem and being equally spaced circumferentially from each other and tapering from a minimum radial width at their lower ends to a maximum radial width at their upper ends;

a windmill disc co-axially abutting against and being integral

with the upper ends of said stem and said ribs to form a circumferential series of at least four radial wind trapping pockets; and

a circumferential series of at least four windmill blades outstruck helically from said disc to provide for the helically directed escape of air compressed by the wind in said pockets and thereby generating a substantial torque operating to constantly rotate said launcher rapidly.

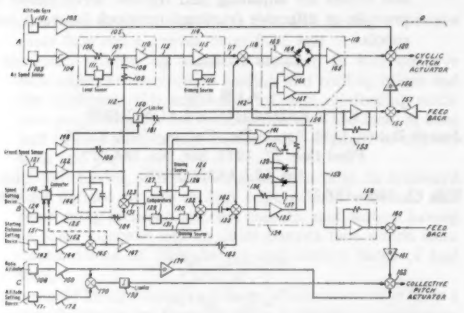
---

**4,129,275**

## AUTOMATIC FLIGHT CONTROL APPARATUS FOR AIRCRAFT

**Milton I. Gerstine, Wilmington, Del.; Joshua I. Goldberg, Ridgefield, Conn.; Setsuo Futatsugi, Kagamigahara, Japan; Kazuo Ueda, Kagamigahara, Japan; Ryozo Seo, Kagamigahara, Japan; Koji Iwasaki, Kagamigahara, Japan, and Makoto Uemura, Kagamigahara, Japan, assignors to The Boeing Company, Seattle, Wash. and Kawasaki Jukogyo Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 634,385, Nov. 24, 1975, abandoned.**
**This application Jun. 1, 1977, Ser. No. 802,333**
**Claims priority, application Japan, Nov. 22, 1974, 49-134513**
**Int. Cl.[2] G05D *1/08***
**U.S. Cl. 244—181** **7 Claims**



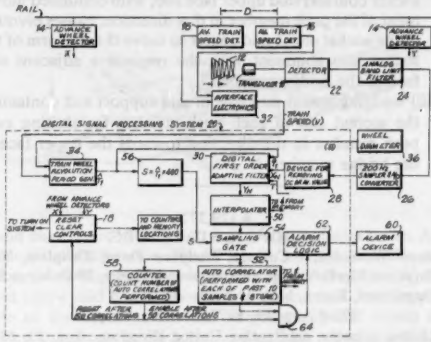
1. Automatic flight control apparatus for aircraft comprising: air speed detecting means for generating an air speed signal; means, connected to said air speed detecting means, for generating a signal representating the desired attitude of the aircraft in balanced relation to the air speed of the aircraft at any instant, said attitude signal serving as a reference signal; means for generating a signal representing the actual attitude of the aircraft; a limiter circuit, connected to said means for generating the signal representing the desired attitude of the aircraft and to said air speed detecting means, said limiter circuit including a pair of amplifiers, a diode bridge connected between the amplifiers, a lower limit setting device and an upper limit setting decive connected to opposed terminals of the diode bridge and to the air speed detecting means, said limiter circuit producing a substantially constant signal limiting width and a signal limiting range which changes with the air speed in response to changes in said reference signal; and means for comparing the signal representing the actual attitude of the aircraft and the reference signal and producing a difference signal between said signals, which is used as at least one control parameter for the aircraft.

**4,129,276**

## TECHNIQUE FOR THE DETECTION OF FLAT WHEELS ON RAILROAD CARS BY ACOUSTICAL MEASURING MEANS

**Frank A. Svet, Churchville, N.Y., assignor to General Signal Corporation, Rochester, N.Y.**

**Filed Jan. 30, 1978, Ser. No. 873,566**
**Int. Cl.[2] B61L *1/06***
**U.S. Cl. 246—169 S** **11 Claims**



1. Apparatus for acoustically detecting the presence of flat wheels on railroad cars, comprising

an electro-acoustic transducer located on the track wayside so as to pick up vibrations generated by a passing train, and to provide a spectrum of electrical signals corresponding to the vibrations;

means for demodulating and band limiting said spectrum of electrical signals from said transducer;

a sampling analog-to-digital converter connected to said first named means so as to sample signals from the first named means at a predetermined frequency or period;

means for providing a signal indicative of train speed;

a digital first order adaptive filter for receiving sample signals from said converter and a signal from said means for providing a signal indicative of train speed, said adaptive filter having a cutoff frequency which is a function of train speed so as to enhance the signal-to-noise ratio of the signals processed thereby;

an autocorrelator for receiving signals from said adaptive filter and for performing autocorrelation with respect to each of the predetermined signal samples and of the ten signal samples preceding each of the predetermined samples;

a sampling gate, including means for permitting signals from said adaptive filter to be transmitted to said autocorrelator is dependence on the train speed.

---

**4,129,277**

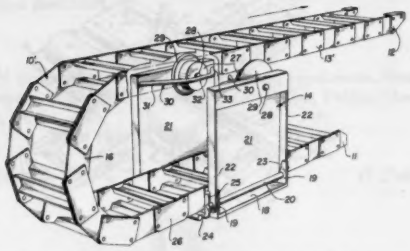
## RETRACTABLE ROLLER SUPPORT FOR USE WITH FLEXIBLE ROLLING SUPPORT FOR CONDUCTORS OR CONDUITS

**David M. Tenniswood, Troy, Mich., assignor to McGraw-Edison Company, Elgin, Ill.**

**Filed Feb. 7, 1977, Ser. No. 765,934**
**Int. Cl.[2] H02G *11/00***
**U.S. Cl. 248—51** **17 Claims**

8. A retractable roller support for use with a flexible rolling support for electrical conductors, fluid conduits and the like, comprising a mounting base, spaced opposed upstanding sides rising from the mounting base and pivoted to the mounting base adjacent opposite sides thereof on substantially parallel pivot axes, support rollers mounted on said opposed sides adjacent the tops thereof, camming means on said sides disposed above the mounting base for spreading said sides and rollers by pivoting them on said pivot axes upon engagement

by a rolling support passing between said sides and oppositely extending return arms fixedly secured to said sides and being



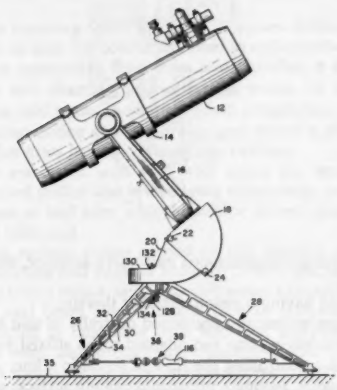
bodily movable therewith, said arms extending transverse to said pivot axes.

---

**4,129,278**
**TRIPOD**

**Peter W. Bressler, Philadelphia, Pa., assignor to Edmund Scientific Company, Barrington, N.J.**

**Filed Sep. 2, 1977, Ser. No. 830,088**
**Int. Cl.[2] F16M *11/32***
**U.S. Cl. 248—165** **23 Claims**

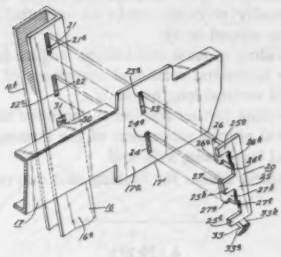


1. A stable multilegged support comprising:
a head having inwardly facing side wall means;
a plurality of legs, each leg having shoe means located at the upper end adapted to engage and push outwardly against said wall means, and having a lower end for engaging a surface upon which the support rests;
means cooperating with said legs and providing a pivot whereby motion of the lower ends of said legs in an inward direction results in outward motion of said shoe means against said wall means; and
tensionable connecting means secured to the lower ends of said legs for releasably urging the lower ends of said legs inwardly in order to urge said shoe means outwardly against said wall means with a force sufficient to prevent removal of said head from said shoes;
said pivot being so located with respect to the shoes and the connecting means as to provide a mechanical advantage, whereby a relatively small tightening force in said connecting means results in large forces acting between said shoes and said wall means.

**4,129,279**
**TRUSS CLIP**

**Harvey Z. Burkholder, Ephrata, Pa., assignor to Favorite Manufacturing, Inc., New Holland, Pa.**

**Filed Jan. 9, 1978, Ser. No. 868,223**
**Int. Cl.[2] A47F *5/00***
**U.S. Cl. 248—165** **7 Claims**



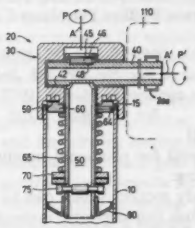
1. In a truss assembly adapted to be assembled with a like truss assembly to provide supports for animal cages, said truss assembly including a pair of legs and at least one cross member extending across the legs, said legs and cross member each having web portions engaging flush against one another and having aperture means in said engaging web portions, the improvement comprising clip means for connecting said cross member to each leg, said clip means having a flange engaging the web portion of said cross member, lug means extending from said flange and rearwardly through said aperture means, said lug means having hook means disposed behind said leg below its aperture means after said cross member and clip have been assembled and slid downwardly relative to said leg, means on each leg providing an edge adjacent the aperture means therein, said edge being located relative to said cross member so as to be exposed after said cross member and clip have been slid downwardly and said hook means disposed below the lower edge of the aperture means in the legs, and deformable tab means carried on said clip flange and adapted to be engaged with said edge to limit upward movement of said cross member and clip relative to the leg for preventing inadvertent disengagement of the cross member from the leg.

---

**4,129,280**
**PIVOT MECHANISM**

**André Ruegg, Zürich, and Wilfried Beck, Winterthur, both of Switzerland, assignors to Contraves AG, Zürich, Switzerland**

**Filed Dec. 27, 1977, Ser. No. 864,484**
**Claims priority, application Switzerland, Feb. 7, 1977, 1447/77**
**Int. Cl.[2] F16M *13/12***
**U.S. Cl. 248—183** **9 Claims**



9. A pivot mechanism for pivotably laterally securing a housing at a stand, comprising:
a first body;
a second body;

said second body being rotatably mounted at one end in the first body;

said second body being capable of being operatively connected at its other end with the housing;

a headpiece;

means for mounting the first body and the second axle body in said headpiece such that the housing can be horizontally rotated about an essentially vertical axis of the first body and vertically pivotable about an essentially horizontal axis of the second body;

means providing at least one friction surface for the headpiece for horizontal rotational movement of the housing about said vertical lengthwise axis;

means providing further friction surfaces for the headpiece for vertical pivotal movement of the housing about said horizontal lengthwise axis; and

a single resilient means for braking said movements of the housing.

---

**4,129,281**

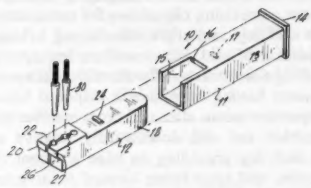
## DOWEL RECEIVING CORE FOR CASTING DENTAL RESTORATIONS

**Abraham J. Cooper, P.O. Box 321, Pomona, N.Y. 10970**

**Filed Jul. 22, 1977, Ser. No. 818,053**

**Int. Cl.[2] A61C *13/12*; B28B *1/14***

**U.S. Cl. 249—54** **5 Claims**



1. A core assembly for use in casting models for dental restorations in which dowels are incorporated within the cast material beneath individual tooth members comprising a resilient sleeve having an elongated hollow body of rectangular cross-section, an elongated resilient dowel receiving member telescopically received within the sleeve; a longitudinal slot in the free end of the dowel receiving member, dividing the said dowel receiving member into spaced jaws, a plurality of transverse dowel receiving bores in the free end of the dowel receiving member extending parallel to the plane of the slot at least one of which is in communication with the said slot, and means carried by the sleeve and dowel receiving member to exclude casting material from the interior of the sleeve.

---

**4,129,282**

## MOLD APPARATUS

**John N. Scott, Jr., and Guy E. Carrow, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.**

**Division of Ser. No. 699,829, Jun. 25, 1976, Pat. No. 4,076,282, which is a division of Ser. No. 599,738, Jul. 28, 1975, Pat. No. 3,989,787. This application Nov. 8, 1977, Ser. No. 849,682**

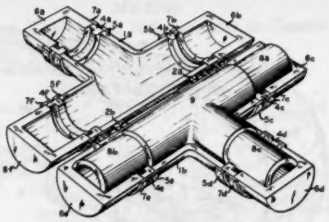
**Int. Cl.[2] B29C *5/00***

**U.S. Cl. 249—137** **4 Claims**

1. A mold useful for rotational molding of thermoplastic articles comprising:

(a) a mold body section which can be rotated and heated such as to fuse thermoplastic material contacting the inside surface of the mold body section and which mold body section has at least one opening, and

(b) means for attaching at least one conduit to said mold body section at said one opening and for heat-insulating a first portion of said conduit so that a second portion of said conduit of material attached by said means to said mold body section reaches into said heated mold body section and the first portion of said conduit is not sufficiently heated during a rotational molding process to deform said conduit.



---

**4,129,283**

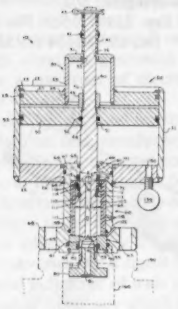
## ACTUATOR

**Joseph W. Taylor, P.O. Box 40509, Houston, Tex. 77040**

**Continuation of Ser. No. 598,355, Jul. 23, 1975, abandoned, which is a continuation of Ser. No. 511,983, Oct. 4, 1974, abandoned. This application Nov. 3, 1976, Ser. No. 738,564**

**Int. Cl.[2] F16K *31/122***

**U.S. Cl. 251—62** **4 Claims**



1. In a pressure imbalanced gate valve actuator, the combination of:

a housing having a piston chamber therein;

a stem reciprocatably positioned centrally of said housing;

said stem having one end adapted to be affixed to a valve gate for controlling the flow of liquid in a line;

a first piston, having a pressure receiving surface, affixed to said stem within said first piston chamber;

means for directing a pilot fluid against said first piston pressure receiving surface in a direction tending to cause said gate to open said valve;

a bonnet member linked to said housing, said bonnet having a further piston chamber therein bounded by upper and lower walls as well as by the interior diameter of said bonnet said upper and lower bonnet walls each having apertured means and fluid tight seals for reciprocatingly receiving a portion of said stem intermediate said first piston and said stem's one end;

a further piston affixed to said stem within said further piston chamber, said further piston also including a pressure receiving surface;

means for causing said actuator to be imbalanced when said valve is both open and closed, said causing means including a line fluid passageway through said stem from said one end to a stem exit opening adjacent said further piston pressure receiving surface; and

said further piston is of sufficient diameter such that the biasing force exerted against it by said line fluid tending to

close said gate, it at all times, including when said gate is open and closed, greater than the force exerted by said fluid tending to cause said stem to move said gate to an open position.

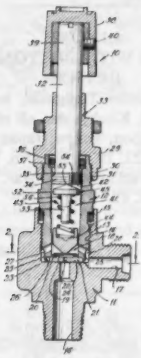
---

**4,129,284**

## METERING VALVE

**John N. Scapes, Schaumburg, and Donald R. Speckmann, Mount Prospect, both of Ill., assignors to Gould Inc., Rolling Meadows, Ill.**

**Filed Feb. 23, 1977, Ser. No. 771,164**
**Int. Cl.² F16K *1/52***
**U.S. Cl. 251—205** **17 Claims**



1. In a metering valve having wall means defining a flow chamber, an inlet for conducting fluid to said chamber, and an outlet for conducting fluid from said chamber, a deflectible beam in said chamber, and adjustable means for adjustably deflecting said beam, the improvement comprising:

a selected orifice disc comprising any one of a plurality of orifice discs having different size orifices;

means associated with said wall means for securing the selected orifice disc in overlying relationship to said wall means at said inlet with the orifice thereof aligned with said inlet; and

annular support means carried on said selected orifice for supporting said beam in accurate closely spaced relationship to said orifice, said adjustable means adjustably deflecting said beam toward said orifice to provide accurate metering of fluid flow from said inlet and orifice about said beam and through said chamber to said outlet, said wall means defining an annular recess coaxially of said inlet receiving the periphery of the selected disc in accurate coaxial relationship to said inlet, and an annular portion coaxially inwardly of said recess and defining the inlet portion of said chamber snugly receiving said annular support means in accurate alignment with said inlet.

---

**4,129,285**

## CHAIN AND TIGHTENING BINDER ASSEMBLY

**John P. Graham, P.O. Box 37, Fort Gaines, Ga. 31751**

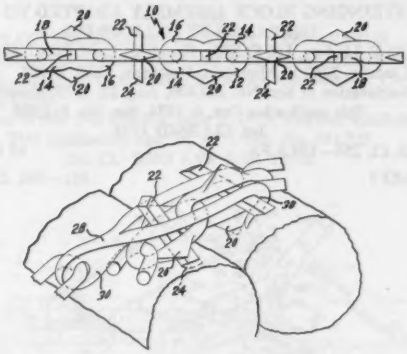
**Filed Mar. 18, 1977, Ser. No. 779,274**
**Int. Cl.² B60P *7/06*; B61D *47/00*; B66F *3/00*; F16G *13/04***
**U.S. Cl. 254—78** **8 Claims**

1. A chain for binding logs on a transport platform comprising a plurality of sequentially connected links, each said link comprising:

a. a generally planar loop having two opposed end portions adapted to interconnect other links and two continuous, spaced apart opposed side leg portions integral with said end portions and defining a central opening therebetween;

b. two rigid extensions, one said extension being integral with each respective said leg portion of said loop and extending laterally outwardly therefrom in the plane of said loop, each said extension having a sharpened outwardly terminal and;

c. an elongated bar member extending through said central opening and welded to said legs, said bar member being



oriented to extend in a direction normal to the plane of said loop and having straight body portions extending equidistantly above and below said plane outwardly beyond the upper and lower edges of said leg portions.

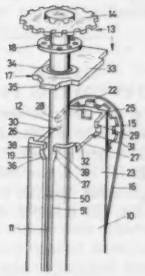
---

**4,129,286**

## LIFTING JACK FOR VEHICLES

**Wolfgang Anell, Zerf, Fed. Rep. of Germany, assignor to Firma August Bilstein, Wuppertal-Barmen, Fed. Rep. of Germany**

**Filed Feb. 3, 1977, Ser. No. 765,124**
**Claims priority, application Fed. Rep. of Germany, Feb. 11, 1976, 7603865[U]; Oct. 25, 1976, 2648196**
**Int. Cl.² B66F *3/18***
**U.S. Cl. 254—103** **6 Claims**



1. A lifting jack for vehicles, comprising an axially slotted support leg, a load bearing member projecting outwardly from said support leg, a rotatable screw-threaded spindle, means mounting the load bearing member for nonrotatable movement along the length of said support leg in response to rotation of said spindle; means for transmitting rotary movement to said spindle mounted at an upper end of said support leg; the transmitting means comprising a driving pinion and gear means meshing therewith; said support leg having upwardly extending distal edges disposed adjacent said gear means; said gear means being rigidly secured to said spindle for rotatable movement therewith; a bearing for supporting said gear means engaging the undersurface thereof; a bearing plate supporting said bearing; portions of said distal edges of said support leg being slotted so as to define supporting edge surfaces on which said bearing plate is received; means locking said bearing plate to said support leg, said support edge surfaces supporting said bearing plate below said distal edges a distance which is less than the thickness of said bearing extending between said

bearing plate and said gear means whereby said gear means is spaced from said support leg upper end and may rotate exteriorly of said support leg.

---

**4,129,287**

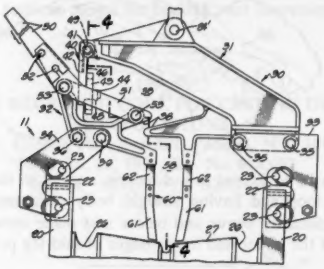
## STRINGING BLOCK ASSEMBLY ADAPTED TO BE THREADED BY HELICOPTER

**Keith E. Lindsey, 110 El Nida, Pasadena, Calif. 91107, and L. E. Lindsey, 2262 E. Mountain, Pasadena, Calif. 91104**

**Continuation of Ser. No. 282,430, Aug. 21, 1972, abandoned. This application Oct. 4, 1974, Ser. No. 512,005**

**Int. Cl.² B66D *1/36***

**U.S. Cl. 254—134.3 PA** **68 Claims**



50. A stringing block assembly having an open ended conductor hauling line threading passage adapted to be threaded by a hauling line dispensed from an aircraft, load transfer means movably supported crosswise of said threading passage and movable by a hauling line as the latter moves along said threading passage to effect movement of said load transfer means to a position blocking escape of the hauling line backwardly through said passage, and operable to transfer load stresses across said threading passage.

---

**4,129,288**

## HOOD TO BE USED IN A METAL PRODUCTION PLANT

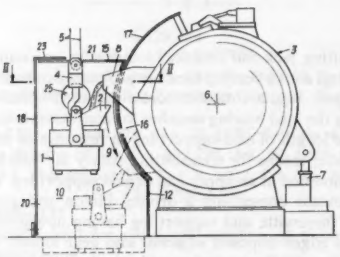
**Friedrich Laimer, Perg, and Peter Moser, Linz, both of Austria, assignors to Vereinigte Österreichische Eisen-und Stahlwerke - Alpine Montan Aktiengesellschaft, Linz, Austria**

**Filed Feb. 13, 1978, Ser. No. 877,242**

**Claims priority, application Austria, Feb. 28, 1977, 1313/77**

**Int. Cl.² C21C *5/40***

**U.S. Cl. 266—158** **7 Claims**



1. In a hood to be used in a metal production plant of the type including a crane, carrying means arranged on said crane, a ladle having a mouth and being hung from and guided by said carrying means, and a tiltable metallurgical vessel having a lip for pouring out molten metal, said hood having an interior surrounded by a ceiling and side walls and being used for diverting flue gas and smoke emerging while pouring said molten metal from said tiltable metallurgical vessel into said ladle, the improvement comprising

an arrangement of the ceiling and side walls such that said hood covers the mouth of said ladle and said carrying means on all sides thereof,

said hood being provided, on a first one of said side walls which is adjacent said metallurgical vessel, with an opening, said lip of said tiltable metallurgical vessel projecting into the interior of said hood through said opening, and

said hood being provided on one of said side walls and part of said ceiling with a closeable recess, said carrying means with said ladle being movable into and out of said closeable recess.

---

**4,129,289**

## SHAFT FURNACE WITH BOTTOM DISCHARGE DEVICE

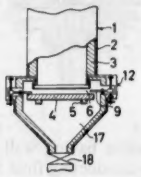
**Satoru Miyasita; Masahiko Taniguchi, both of Himeji, and Katsuyoshi Kobayashi, Kitakyushu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan**

**Filed Mar. 22, 1977, Ser. No. 780,014**

**Claims priority, application Japan, Mar. 26, 1976, 51/33242**

**Int. Cl.² C21B *7/14***

**U.S. Cl. 266—195** **8 Claims**



1. A shaft furnace comprising an upper portion adapted to have a furnace feed charged thereinto, a furnace wall lower end adapted to have a furnace product discharged therefrom, said furnace wall lower end being configured with a given circumferential dimension, and a furnace bottom located directly beneath said furnace wall lower end and spaced therefrom a sufficient distance to provide therebetween an opening large enough to permit the furnace product to pass therethrough, said furnace bottom having a circumferential dimension larger than said given circumferential dimension of said furnace wall lower end, and a discharging device including at least one raking arm swingable over the circumferential portion of said furnace bottom, said shaft furnace further comprising driving means for driving a plurality of said discharging devices, said driving means being adapted to drive said plurality of discharge devices both synchronously and sequentially in a timed sequence.

---

**4,129,290**

## COMPRESSION AND TENSION SPRING

**Jakhin B. Popper, Kyriat Motzkin, Israel, assignor to Popper Engineering Ltd., Kyriat Motzkin, Israel**

**Filed May 16, 1977, Ser. No. 797,111**

**Claims priority, application Israel, May 14, 1976, 49583**

**Int. Cl.² F16F *3/02***

**U.S. Cl. 267—160** **14 Claims**

2. A spring comprising:

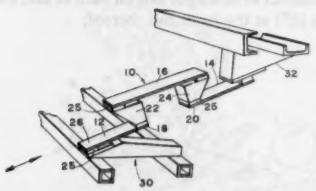
a first flexible member having a first inner end and a first outer end and extending linearly along a first longitudinal axis at rest;

a second flexible member having a second inner end and a second outer end and extending linearly along a second longitudinal axis at rest; and

spacer means connecting said first flexible member adjacent said first inner end to said second flexible member adja-

cent said second inner end in spaced generally parallel disposition at rest;

and wherein said first flexible member bows outwardly in a direction opposite that facing said second longitudinal axis and said second member bows outwardly in a direction opposite that facing said first longitudinal axis in response to the application of a compression force on said respective first and second flexible members along an axis parallel to said first and second longitudinal axes; and



said first flexible member bows inwardly in a direction towards said second longitudinal axis and said second member bows inwardly in a direction towards said first longitudinal axis in response to the application of a tension force on said respective first and second flexible members along an axis parallel to said first and second longitudinal axes.

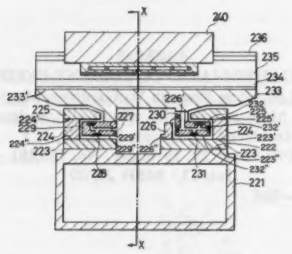
---

**4,129,291**

## TWO-DIMENSIONAL PRECISION TABLE

**Shigeo Kato, Mitaka; Osamu Morita, Hachioji, and Sadao Matuoka, Kanagawa, all of Japan, assignors to Hitachi, Ltd., Japan**

**Filed Jul. 25, 1977, Ser. No. 818,743**
**Claims priority, application Japan, Jul. 23, 1976, 51/87294**
**Int. Cl.[2] B23Q *1/02***
**U.S. Cl. 269—73** **27 Claims**



1. A table arrangement for precision working of a workpiece, the arrangement comprising:

a rigid support means,

means for accommodating a workpiece, and

means for mounting said accommodating means at said rigid support means so as to permit said accommodating means to be selectively displaceable in two directions,

said mounting means including an externally supplied pressurized gas bearing means for providing a gas film between portions of said rigid support means and said accommodating means,

said gas bearing means includes at least one guide means arranged on said rigid support means, said guide means having a plurality of spaced internal guide surfaces arranged so as to define a substantially J-shaped guide opening, and

gas jet means arranged within said guide means for directing at least one jet of a gas toward at least one internal guide surface of said guide means,

said gas jet means being dimensioned such that a clearance is provided between an outer surface thereof and the internal guide surfaces of said guide means,

the at least one jet of gas from said gas jet means forming the gas film in the clearance between the gas jet means and said guide means.

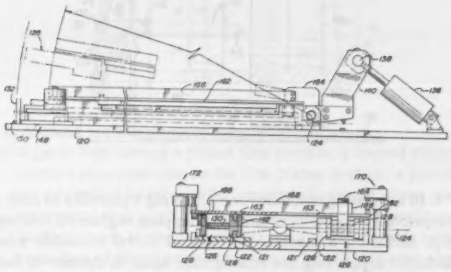
---

**4,129,292**

## ELECTRODE SHEET ASSEMBLY APPARATUS

**Gerald R. Pohto, Mentor, and Richard O. Olson, Parma, both of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio**

**Division of Ser. No. 576,014, May 9, 1975, Pat. No. 4,033,849.**
**This application Apr. 28, 1977, Ser. No. 791,725**
**Int. Cl.[2] B25B *1/04, 5/04, 11/02***
**U.S. Cl. 269—126** **1 Claim**



1. Apparatus for assembling a pair of planar electrode sheets to an electrode riser subassembly of the type comprising a cylindrical riser with a pair of generally V-shaped connector members joined at their bight portions to the riser and extending longitudinally thereof on diametrically opposite sides with their legs extending radially, comprising:

an elongated base including a spaced pair of parallel elongated grooves opening therethrough and longitudinally extending bars for supporting a first electrode sheet to extend generally horizontally and spaced upward slightly;

support saddles midway between the base grooves for supporting a cylindrical riser on said base;

two arm members carried by said base and mounted for pivotal movement about a first axis parallel to said base, said arm members including conductor bars having a vertical height generally equal to the spacing between the connector portions of each of the connector members on the electrode riser such that the riser and connector members as attached can be slid onto said conductor bars for supporting said electrode riser subassembly for movement from a first position spaced from said base to a second position wherein said cylindrical riser extends parallel to said base and the end portions of one leg of each said member can be brought into engagement with the first electrode sheet;

actuating cylinder pivotally connected to said base and said arm members for selectively tilting movement of said arm members;

an upper platen member carried by said base and superposed relative to said arm members, said upper platen member mounted for movement from a first position spaced from said arm members to a second position wherein a second electrode sheet can be held in engagement with the end portions of the other leg of said conductor member, said upper platen member including a pair of elongated grooves formed thereto in alignment with the grooves in said base;

clamp means for rigidly clamping said arm members and said upper platen member to said base while in their second positions; and

wherein said conductor bars are of non-uniform height throughout their length such that said conductor bars have a greater height at the center and taper uniformly

toward each end, thus to apply a prestress to the assembly which results in a more nearly flat and parallel relationship between the electrode sheets.

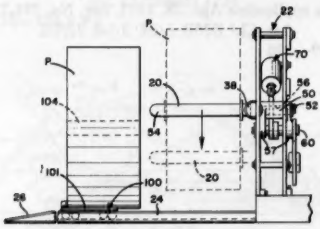
---

**4,129,293**

## COLLATING MACHINE WITH LARGE ROLL SUPPLY

**Louis Schriber, and Robert E. Stephens, both of Dayton, Ohio, assignors to Harris Corporation, Cleveland, Ohio**

**Filed Aug. 19, 1975, Ser. No. 605,903**
**Int. Cl.[2] B65H *39/00***
**U.S. Cl. 270—52** **5 Claims**



1. In a collating machine for assembling a plurality of rolls of pre-printed web material into overlapping registered relationship, including a machine frame and plural rotatable arbor shafts for supporting the rolls spaced apart in cantilever fashion, and means for withdrawing the web material from each of said rolls and combining the webs as a multi-layer unit, the improvement comprising:

a roll supporting work surface extending to one side of said frame beneath said arbor shafts and arranged to permit rolling of heavy full rolls into loading position on said work surface,

a plurality of support arms each rotatably carrying one of said arbor shafts and each pivoted on said frame for moving said arbor shafts between a lower loading position wherein rolls can be pushed from said working surface onto said arbor shafts and a supply position raised above said surface at which the web material can be unwound from the rolls,

independently operable motor means connected to move each said support arms between the loading and supply positions, and

roll carrying dollies movably mounted on said surface to transport rolls onto those arbor shafts located in loading position and supporting the weight of the rolls until the rolls are fully mounted onto said arbor shafts.

---

**4,129,294**

## SHEET-FEEDING MECHANISM ACTING ON FRONT CORNER REGIONS OF A SHEET

**Josef Marass, Seehausen, Germany, assignor to Georg Spiess GmbH, Gersthofen, Germany**

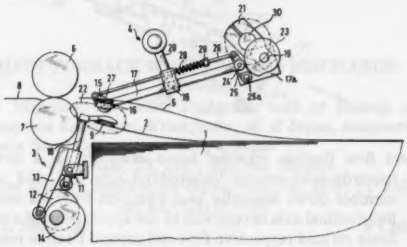
**Filed Aug. 11, 1977, Ser. No. 823,753**
**Claims priority, application Fed. Rep. of Germany, Aug. 18, 1976, 2637218**
**Int. Cl.[2] B65H *3/40***
**U.S. Cl. 271—93** **18 Claims**

1. A sheet-feeding mechanism provided with apparatus for repetitively separating a top sheet of a stack of sheets of material having at least the stiffness of paper and transferring said sheet to apparatus for transporting the said sheet to other apparatus capable of accepting said sheet, comprising in combination:

top sheet separator means (3) located adjacent to front edge of a stack (1) of sheets that is in position for sheet-feeding and having suction lift heads (9) located above the respective front corner regions of the top sheet of said stack, for lifting at least the front edge of said top sheet (2) off the top of the stack;

first and second swing rod means (17) mounted so as to be able to swing near the respective sides of said stack for producing motion of their respective front ends in the respective regions of each of the front corners of said top sheet, in each case suspended on two crank arms (20,21) both located above said stack;

an inwardly directed carrier arm (16) mounted rotatably with respect to its length axis on each of said swinging rod means (17) at the front end thereof;



a suction sheet-pulling device (15) on each of said carrier arms (16); and

control means including a cam (23) mounted on one of said crank arms (20,21) for rotating each of said carrier arms (16) about its length axis;

whereby said suction sheet-pulling devices (15) are caused to be moved in a closed curve in the feed direction and back, moving below the lifted top sheet to grasp it on its underside beneath the respective most lifted portions thereof to lead it to a succeeding transport mechanism.

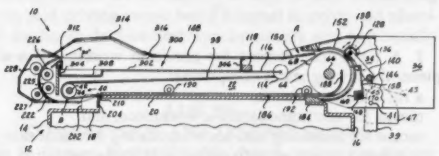
---

**4,129,295**

## SEMIAUTOMATIC DOCUMENT FEEDER

**Tatsu Hori, Los Altos; Kenneth W. Gardiner, Menlo Park, and Norman F. Mangal, Palo Alto, all of Calif., assignors to Savin Business Machines Corporation, Valhalla, N.Y.**

**Filed Dec. 29, 1976, Ser. No. 755,181**
**Int. Cl.[2] B65H *29/00***
**U.S. Cl. 271—186** **20 Claims**



1. In a document feeder for a photocopying machine having a generally horizontal imaging platen adapted to receive a document to be copied, said feeder including a stacking tray disposed above said imaging platen, apparatus comprising first guide means adjacent to one end of said platen for guiding a document moving off said one end of said platen along a curved path having an exit portion extending generally upwardly and in the direction of said tray and second guide means spaced above said tray for engagement by the leading edge of said document and for guiding said document into said tray, at least part of said second guide means comprising a transparent member formed with spaced longitudinal ribs on the underside thereof.

## 4,129,296
## RIDING TOY WITH REMOVABLE BODY PORTION

Burton C. Meyer, Downers Grove, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 14, 1977, Ser. No. 767,399
Int. Cl.[2] A63G *17/00*
U.S. Cl. 272—52 7 Claims

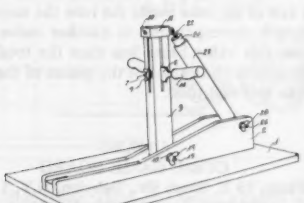
1. A riding toy, comprising:
a separate rigid base in the form of a rocker;
a body supported on said base, said body being fabricated of substantially soft cushion-like material on which a child may comfortably sit; and
means removably mounting said body on said base, and means comprising a pair of flexible straps on said body and bosses on said base about which said flexible straps can be wrapped, whereby the body can be removably mounted on the base.

---

## 4,129,297
## ARM WRESTLING DEVICE

John W. Dolan, 194 Rustic Rd., Lake Ronkonkoma, N.Y. 11779

Filed Jun. 14, 1976, Ser. No. 658,721
Int. Cl.[2] A63B *5/00*
U.S. Cl. 272—67 3 Claims

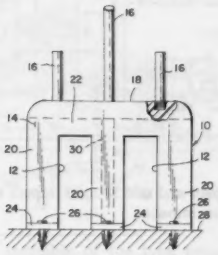


1. An arm wrestling device comprising a base, a channel mounted to the base, wherein the channel is sized so as to receive an arm in the pivoting of the arm, and guide the arm therein, the arm pivotally mounted to and within said channel, and a hand grip transversely disposed to and attached to said arm, and spring means disposed in said channel and mounted at one end to the upper portion of the arm and pivotally mounted at the other end adjacent the base, said spring means being mounted in a retractably extensible cylinder, and said cylinder further comprising air brake means, to counter the retraction of the spring upon release of the hand grip, whereby the user grips and pulls the hand grip causing pivoting of the arm and pivoting and extension of the spring means.

## 4,129,298
## GAME APPARATUS

Dwight Richardson, and Jerome Richardson, both of 2011 Old Elm Rd., Lindenhurst, Ill. 60046

Filed Feb. 17, 1977, Ser. No. 769,445
Int. Cl.[2] A63B *67/06*
U.S. Cl. 273—100 7 Claims



1. A game apparatus comprising:
a. a game base having a planar first portion, a second planar portion perpendicular to the first planar portion, a plurality of spaced apart parallel vertical elongated arms, one horizontal elongated arm interconnecting said plurality of vertical arms at the top ends thereof, wherein one common face of the arm corresponds to said first planar portion, the top of said horizontal arm corresponds to said second planar portion, means defining a plurality of elongated apertures through said first portion each having an open side, wherein the spaces between the horizontal arms corresponds to said elongated apertures, and a plurality of pegs each connected at one end thereof to said second portion and projecting outwardly therefrom;
b. means for mounting the game base on a given plane to dispose the first portion perpendicular to the given plane with the open side of the apertures adjacent thereto and the second portion parallel thereto and at the top of the game base, wherein said means mounting the game base includes a plurality of planar mounting members each perpendicularly connected to the bottom end of one of said vertical arms and each having an aperture therethrough for effecting the connecting thereof to said given plane, a brace, said brace connected to one of said plurality of vertical arms on the side thereof opposite to said first planar portion and having an aperture at a lower portion thereof for effecting connecting to the given plane; and
c. at least one game ring having an outer diameter and thickness configured to pass through any of the apertures and an inside diameter configured to encircle any of the pegs, whereby each ring can be either rolled through the apertures or thrown around the pegs.

---

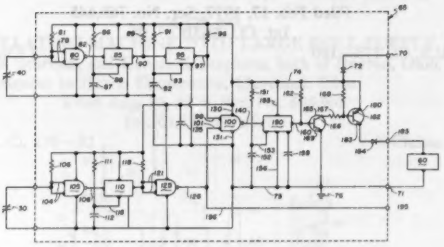
## 4,129,299
## APPARATUS FOR HIT SCORING TARGETS

Theodore N. Busch, Minneapolis, Minn., assignor to Caswell Equipment Company, Minneapolis, Minn.

Filed Feb. 11, 1977, Ser. No. 767,841
Int. Cl.[2] A63B *63/02, 69/00*
U.S. Cl. 273—102.2 S 12 Claims

12. A system for scoring hits on a frame mounted target comprising:
first impact sensing means mounted to respond to impacts on said target and said frame;
second impact responsive means mounted to respond only to hits on said frame; and
hit recording means connected to said first impact sensing

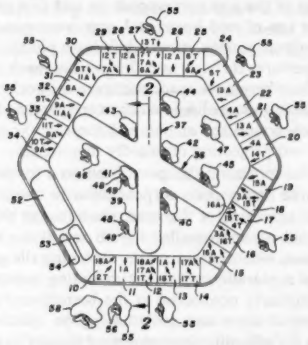
means and said second impact sensing means for registering hits only when said first impact sensing means senses



an impact and said second impact sensing means does not sense an impact.

---

**4,129,300**
**COMPACT GOLF COURSE**
**Arthur P. Magnuson, 1012 W. Burnsville Crosstown, Burnsville, Minn. 55357**
**Filed Nov. 18, 1976, Ser. No. 742,768**
**Int. Cl.[2] A63B *69/36***
**U.S. Cl. 273—176 A** **8 Claims**

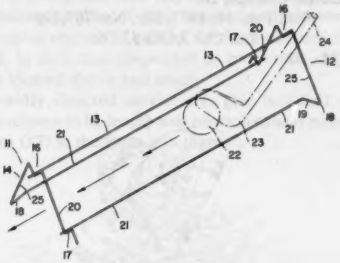


1. A compact golf course in which there are two sets of playing areas, one of said sets being in the form of ball hitting areas and the other in the form of elongated target fairway areas, said ball hitting areas extending generally around the target fairway areas, said target fairway areas being in the form of no more than two relatively well defined elongated areas extending substantially across the area between said ball hitting areas and intersecting each other at intermediate portions thereof at an angle with respect to each other, said number of target fairway areas being substantially less than the holes of golf to be played and substantially less than the number of ball hitting areas, and a plurality of target greens along said target fairway areas and spaced varying distances along each fairway area from said ball playing areas.

---

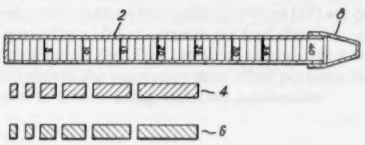
**4,129,301**
**GOLF PUTTING TRAINING DEVICE**
**Jerald R. Kenney, P.O. Box 1817, Crystal Bay, Nev. 89402**
**Filed Aug. 29, 1977, Ser. No. 828,839**
**Int. Cl.[2] A63B *69/36***
**U.S. Cl. 273—186 R** **3 Claims**

1. A golf putting training device comprising a pair of end members each formed to define an inverted U-portion with an integral leg extending generally orthogonally from one end of each of said inverted U-portions, a first detent formed in the other end of each of said U-portions; said end members disposed in parallel, spaced relationship with said leg of each resting in said first detent of the other and disposed for selective dislogement therefrom by an imperfect putting stroke carried out between said legs and said inverted U-portions.



---

**4,129,302**
**GAME OF SKILL**
**Gregory B. Stone, 48 Rue Jacob, Paris, France (75006)**
**Filed Apr. 11, 1977, Ser. No. 786,618**
**Claims priority, application United Kingdom, Apr. 13, 1976, 15089/76**
**Int. Cl.[2] A63F *3/00***
**U.S. Cl. 273—236** **10 Claims**



1. A game of skill including two sets of playing pieces each having the same number of pieces, the pieces being of regular cross-section, the sets being distinguished from each other by a characteristic, and each set comprising pieces of various lengths to represent consecutive values in the Fibonacci series; and a measure which comprises a hollow tube which is transparent or translucent about at least a part of its circumference and along the length and is adapted to receive the playing pieces as a loose sliding fit in end-to-end relationship extending along the axis of the tube inside the tube the measure having a marked length corresponding to another value in the Fibonacci series, this value being less than the total obtained by summing together the values of the pieces of the two sets but greater than half that total.

---

**4,129,303**
**CUBIC GAME BOARD**
**John G. Flagg, 19 E. Shore Dr., Babylon, N.Y. 11702**
**Filed Mar. 31, 1977, Ser. No. 783,149**
**Int. Cl.[2] A63F *3/00***
**U.S. Cl. 273—241** **2 Claims**

1. A game board for adversary and countermove type games comprising

a cube presenting six planar playing surfaces of uniform character,

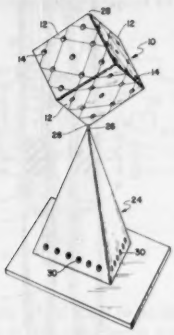
each of said planar surfaces including a plurality of bores arranged in a rectangular matrix pattern of not less than three by three nor more than five by five bores therein,

a plurality of pin members each releasably retainable in a bore,

visually sensible indicia on said planar playing surfaces for selectively identifying each of said planar playing surfaces,

a bore disposed at a corner of said cube, and

a supporting standard upwardly terminating in an extending pin member receivable within the bore located at a corner of said cube for positioning said cube in space with each



planar playing surface being readily visable and physically accessible for pin displacement relative thereto and further having bores therein for receiving the pin members for storage during game play.

---

**4,129,304**

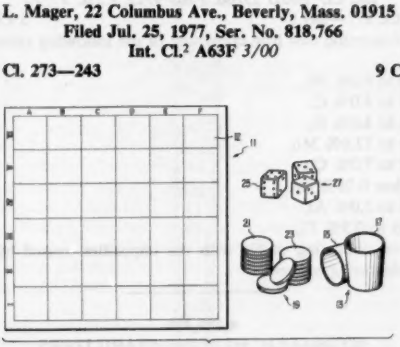
## SELF-LIMITING BOARD GAME COMBINING CHANCE AND SKILL

**Eric L. Mager, 22 Columbus Ave., Beverly, Mass. 01915**

**Filed Jul. 25, 1977, Ser. No. 818,766**

**Int. Cl.[2] A63F *3/00***

**U.S. Cl. 273—243** **9 Claims**



1. A self-limiting board game combining chance and skill comprising:

a plurality of stake means associated with each player of the board game for wagering during play;

a game board including a plurality of locations arranged thereon forming a game movement area, the locations allowing the stake means to be located thereon;

means for setting a quantity of the stake means to be wagered;

means for randomly choosing a location on the game board for the quantity of stake means; and

a plurality of playing pieces representing the individual players for movement around the locations of the game movement area to capture the stake means.

**4,129,305**

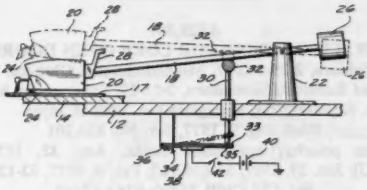
## PHONOGRAPH TURNTABLE ELECTRO-THERMAL CUEING CONTROL

**Roland C. Wittenberg, New Hyde Park, N.Y., assignor to Pickering & Company, Inc., Plainview, N.Y.**

**Continuation of Ser. No. 662,223, Feb. 27, 1976, abandoned. This application Jul. 28, 1977, Ser. No. 819,694**

**Int. Cl.[2] G11B *3/10***

**U.S. Cl. 274—23 R** **3 Claims**



1. In a phonograph turntable of the type comprising: a frame; a record supporting disc defining a generally horizontal plane affixed to said frame and mounted for rotation about a central axis; a tone arm having a first end carrying a cartridge assembly and a second end pivotally mounted to said frame for arcuate movement of said first end toward and away from said central axis and vertical movement toward and away from the plane of said disc; the improvement comprising: a post mounted to said frame for vertical movement beneath said tone arm, said post includes a top end and a horizontal cradle mounted to said top end, said cradle being dimensioned so that portions underlie said tone arm point as said tone arm first end moves from a first position off said record disc to a second position substantially adjacent said central axis, a bimetallic element for directly moving said post vertically having one end fixedly connected to said frame and a free end abutting said post, a heating element positioned adjacent to said bimetallic element, and means for connecting said heating element to a power source whereby upon heating of said element said bimetallic element deflects causing said post to shift vertically at a controlled rate in response to the change of temperature of said element.

---

**4,129,306**

## SEALING MEANS FOR TANK MIXER

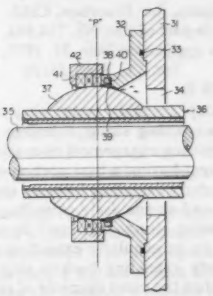
**Daisuke Konno, Yokohama, and Tetsuo Tanaka, Machida, both of Japan, assignors to Ebara Corporation, Tokyo, Japan**

**Filed Nov. 17, 1977, Ser. No. 852,495**

**Claims priority, application Japan, Nov. 29, 1976, 51-158510[U]**

**Int. Cl.[2] F16J *15/24***

**U.S. Cl. 277—30** **9 Claims**



1. A sealing means for use with a swivel ball member dis-

posed adjacent the wall of a tank adapted to contain liquid comprising:

an annular sealing element, the inner diameter of which is smaller than the diameter of said ball member; and

a supporting member for supporting said ball member to allow swivelling movement thereof, said supporting member being provided with an annular groove for receiving said element therein, the position of said groove being arranged closer to the tank than the diametrical section of the ball member.

---

**4,129,307**

## SEALING DEVICE FOR COKE OVEN DOORS

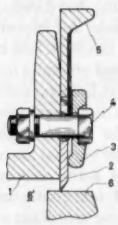
**Taiji Nishiura, 2-35-1-1017, Minamirokugou, Ohta-ku, Tokyo-to, and Kazutomi Shimamura, 2-11-17, Sakuramoto, Kawasaki-ku, Kawasaki-shi, Kanagawa-ken, both of Japan**

**Filed Aug. 9, 1977, Ser. No. 823,201**

**Claims priority, application Japan, Aug. 23, 1976, 51-11260[U]; Jan. 27, 1977, 52-8742[U]; Feb. 4, 1977, 52-12768[U]**

**Int. Cl.² C10B *25/06;* F16J *15/46***

**U.S. Cl. 277—34.3** **2 Claims**



1. A device for sealing a steel door of a coke oven comprising

elastic sealing means disposed on the door and including at least one spring member and an elastic covering tubular member of thin metal being outwardly inflated when a pressure is applied to said elastic sealing means to compress said spring member, said spring member covered by said covering tubular member and disposed to bias the covering member to extend the length thereof in one direction; and

a sealing element having a seal lip, the sealing element being secured to the sealing means in confronting relation to the body of the coke oven, the seal lip engaging surface portions of said coke oven body on closure of the door and being resiliently biased thereagainst by the elastic sealing means.

---

**4,129,308**

## PACKER CUP ASSEMBLY

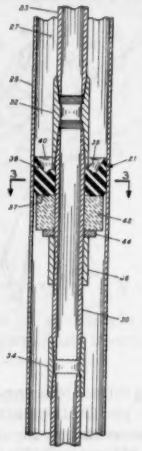
**Stanley O. Hutchison, Bakersfield, Calif., assignor to Chevron Research Company, San Francisco, Calif.**

**Continuation-in-part of Ser. No. 714,941, Aug. 16, 1976, abandoned. This application Mar. 31, 1977, Ser. No. 783,132**

**Int. Cl.² F16J *15/10***

**U.S. Cl. 277—188 R** **6 Claims**

1. A packer cup assembly comprising a mandrel section connectable into a tubing string, a sealing element having a central opening in snug engagement over said mandrel section, said sealing element having a base portion and a face portion including an annularly extending inner lip engaged against said mandrel section and an annularly extending outer lip engageable against a casing string, said inner lip and said outer lip being separated by an annularly extending groove portion, a frangible annularly extending backup ring having an outer diameter of less than the outer diameter of said sealing element and a central opening slidably engageable over said mandrel section, said backup ring having a face portion engaged against the base portion of said sealing element and having a relatively flat base portion and stop means on said mandrel section abutting against the flat base portion of said frangible backup ring to maintain said backup ring in a predetermined position on



said mandrel section, said stop means having a maximum radial extension less than said backup ring and small enough to permit washover if the assembly becomes stuck in a well.

---

**4,129,309**

## AUSTENITIC CAST IRON

**Hans J. Köhnert, Esslingen, and Herbert Smetan, Schorndorf, both of Germany, assignors to Mahle GmbH, Stuttgart, Germany**

**Filed Jun. 1, 1977, Ser. No. 802,550**

**Claims priority, application Fed. Rep. of Germany, Jun. 18, 1976, 2627329**

**Int. Cl.² B65D *53/00;* F16J *9/22;* C22C *37/10***

**U.S. Cl. 277—189.5** **3 Claims**

1. Austenitic cast iron consisting of the following composition:

2.0 to 6.0% Ni,
1.8 to 4.0% C,
1.0 to 3.0% Si,
6.0 to 12.0% Mn,
5.0 to 7.0% Cu,
less than 0.08% Cr,
0.3 to 2.0% Al,
0.05 to 0.3% Ti,

the rest consisting of Fe with the impurities caused by the manufacturing process.

---

**4,129,310**

## HYDRAULIC HEELING STABILIZERS

**Mikal Nordmark, 4062 Klepp stasjon, Norway**

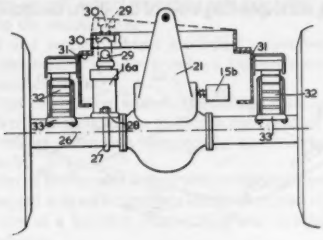
**Filed May 2, 1977, Ser. No. 792,627**

**Int. Cl.² B60G *17/04***

**U.S. Cl. 280—6 H** **4 Claims**

1. In a hydraulic heeling stabiliser for a vehicle having a wheel shaft, a vehicle frame, and leaf springs mounted on the wheel shaft and having the vehicle frame supported thereon, said stabiliser comprising two individual pressure medium cylinders adapted to be mounted one on each side of a longitudinal central plane through said vehicle, valve means for controlling the supply of pressure medium to said cylinders and a swinging pendulum for actuating said valve means, the improvement which consists in said valve means being in the form of two separate control valves each associated with a respective one of the pressure medium cylinders and serving to

couple said cylinders in parallel in a common pressure medium circuit, each control valve having pressure-loaded actuating means adapted to be actuated separately by pivoting the swinging pendulum, whereby only one control valve can be actuated at a time, said cylinders being adapted to extend between the



vehicle frame and the wheel shaft to permit in the unactivated condition springing of the vehicle via respective leaf springs independently of the cylinders, activation of the one cylinder leaving the other cylinder unactivated and causing a portion of that one cylinder to form a support between said frame and said shaft.

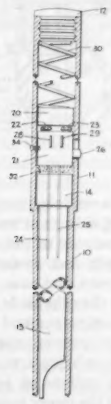
---

**4,129,311**

## ILLUMINATED SKI POLE

**David A. Hodgson, Hamburg, and James S. Grey, East Otto, both of N.Y., assignors to International Power Pole, Ltd., Hamburg, N.Y.**

**Filed Jan. 10, 1977, Ser. No. 758,071**
**Int. Cl.² A63C *11/22***
**U.S. Cl. 280—11.37 E** **4 Claims**



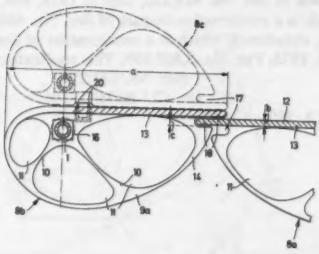
**1.** An illuminated ski pole comprising a pole body having a tubular upper portion, a removable cap at the upper end of said tubular portion, an elongate cylindrical chemiluminescent member inserted in said tubular upper portion, and an opening in the wall of said upper portion of the ski pole in registry with said chemiluminescent member whereby light from said member is emitted radially outwardly of said ski pole, a dry cell battery overlying said chemiluminescent member and probe elements projecting from the terminals thereof downwardly through the upper end of said chemiluminescent member to energize the latter.

**4,129,312**

## SKI POLE

**Eberhard Löffelholz, Thurgauerstrasse 13a, D-77 Singen, Germany**

**Filed Apr. 11, 1977, Ser. No. 786,254**
**Claims priority, application Fed. Rep. of Germany, Apr. 14, 1976, 2616431**
**Int. Cl.² A63C *11/02, 11/18***
**U.S. Cl. 280—11.37 Z** **29 Claims**



**1.** A pair of ski poles, each comprising a pole member having a hand-engaging end and a ground-engaging end, a disk having a peripheral edge, mounted on said pole member adjacent to the ground-engaging end such that a tip of the pole extends beyond said disk, for engaging the ground; scraper means on said disk for cleaning ski boot soles and other flat objects, and means on said periphery of said disk for coupling the disk with a disk of the other of said pair of ski poles to form an assembly having said poles spaced from one another, said scraper means of each disk being located proximate said coupling means and between the poles when the disks are coupled, thus providing a firm frame enabling support of a skier while the boot of the skier can be cleaned on said scraper means.

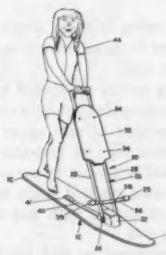
---

**4,129,313**

## SKI DEVICE

**James L. Benson, 4376 Okemos Rd., Apt. C-101, Okemos, Mich. 48864**

**Filed Sep. 6, 1977, Ser. No. 830,689**
**Int. Cl.² B62B *13/16***
**U.S. Cl. 280—12 H** **7 Claims**



**1.** A ski device comprising a ski with a combination handle and seat member pivotably mounted on a forward portion of the ski, the handle and seat member being substantially rigid and being pivotably mounted to the ski at a forward end of the member and extending rearwardly therefrom, the member forming a handle for a skier standing upright on a rear portion of the ski when the member is pivoted upwardly from the ski and the member forming a seat for a skier sitting on the member and the ski when the member is pivoted downwardly into contact with the ski, the seat including a seating portion formed on the side of the handle and seat member so as to present a reasonable seating surface on the upper surface of the

handle and seat member when the member is pivoted downwardly into contact with the ski.

---

**4,129,314**

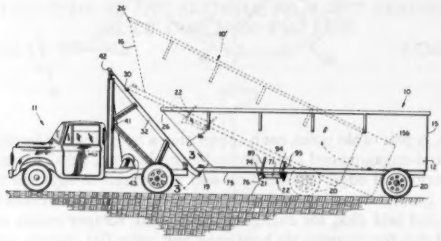
## TOWING VEHICLE WITH ELEVATED RAMP

**Ronald L. Bond, Valdosta; E. Chris Daughdrill, Lake Park; Henry T. Brice, Valdosta, all of Ga., and Phineas E. Horton, III, Portsmouth, Va., assignors to Swacars, Inc., Valdosta, Ga.**

**Division of Ser. No. 611,133, Sep. 9, 1975, Pat. No. 4,054,301, which is a continuation-in-part of Ser. No. 480,606, Jun. 19, 1974, abandoned, which is a continuation of Ser. No. 377,752, Jul. 9, 1973, Pat. No. 3,858,939. This application Oct. 13, 1977, Ser. No. 841,720**

**Int. Cl.[2] B62D *53/06***

**U.S. Cl. 280—425 R** **3 Claims**



1. A towing vehicle for towing a trailing vehicle;

said vehicle having a rear axle and having an elongate track means extending diagonally from a rearward lower elevation to a forward upper elevation with respect to said rear axle;

said track means having a floor and defining an elongate channel including an upper wall having an elongate aperture extending substantially the length of said elongate channel;

hitch carrier means retained within said elongate channel for selective reciprocal movement along said channel;

said hitch carrier means including wheel carrier means and wheel means rotatably connected to said wheel carrier means, said wheel means having a diameter less than the spacing between said lower support surface and said upper wall;

said wheel means being disposed to roll along said floor and being unimpeded from movement upwardly into contact with said upper wall;

a hitch supporting means supported by said wheel carrier means and extending through said elongate aperture so as to be on the outside of said upper wall for reciprocal movement therealong, in response to said reciprocal movement of said hitch carrier means;

hitch means mounted on said hitch supporting means for selective interconnection with and disconnection from a trailing vehicle; and

motive means connected to said hitch carrier means and selectively operative to move the hitch support means along said elongate channel.

---

**4,129,315**

## PLAY VEHICLE

**David F. McCallum, #D 10330 114th St., Edmonton, Alberta, Canada**

**Filed Apr. 15, 1977, Ser. No. 787,773**

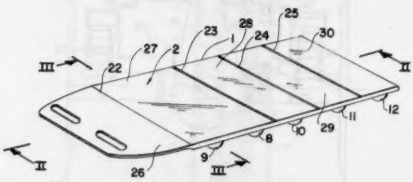
**Int. Cl.[2] B62B *11/00***

**U.S. Cl. 280—87.01** **1 Claim**

1. A play vehicle, comprising

a plate member having a top surface, a bottom surface, a length and a width, said member supporting a rider on its top surface, said plate member being divided by widthwise extending cuts into a plurality of parts;

a plurality of shafts each mounted a predetermined distance beneath the bottom surface of the member and each extending widthwise of the member in spaced parallel relation with the other shafts, corresponding ones of the parts having corresponding ones of the shafts mounted thereon;



a plurality of groups of wheels, each group having an equal number of wheels and each group of wheels being rotatably mounted on a corresponding one of the shafts spaced from the bottom surface of the member in a manner whereby the vehicle is movable on different types of terrain; and

a plurality of hinge means hingedly affixing the parts to each other in a manner whereby the plate member is flexible along its length from part to part.

---

**4,129,316**

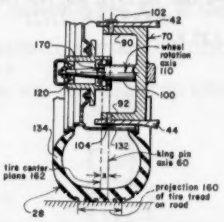
## STEERABLE WHEEL VEHICLE SUSPENSION SYSTEM

**LeRoy W. Ebbert, 20676 Fairmount Blvd., Shaker Heights, Ohio 44118**

**Filed Sep. 6, 1977, Ser. No. 830,798**

**Int. Cl.[2] B62D *7/08***

**U.S. Cl. 280—96.1** **2 Claims**



1. In combination with a vehicle chassis having forward and rearward ends and spaced sides, a steering gear comprising:

(a) first structure on one side of the chassis defining a first pair of spaced upper and lower mounting locations aligned along a common first axis;

(b) second structure on the other side of the chassis defining a second pair of spaced upper and lower mounting locations aligned along a common second axis;

(c) the mounting locations being arranged such that the first and second axes are inclined at equal degrees from the vertical and such that the upper mounting location of each pair is positioned rearwardly with respect to the vehicle chassis from its associated lower mounting location, whereby the first and second axes defined by the mounting locations are inclined forwardly downwardly;

(d) first and second spindle members positioned respectively between the mounting locations of the first and second structures;

(e) a first pair of king pins extending along the first axis and pivotally connecting the first spindle member to the first structure in the vicinities of the first pair of mounting locations;

(f) a second pair of king pins extending along the second axis

and pivotally connecting the second spindle member to the second structure in the vicinities of the second pair of mounting locations;

(g) the first and second spindle members, respectively, defining first and second wheel mounting axes, the first wheel mounting axis extending perpendicular to the first axis, and the second wheel mounting axis extending perpendicular to the second axis;

(h) first and second wheels journaled respectively on the first and second spindle members and each having a tire mounted on a rim;

(i) the rim of the first wheel intersecting and overhanging the first axis sufficiently to locate the tread of its associated tire at a location intersecting and overhanging the first axis;

(j) the rim of the second wheel intersecting and overhanging the second axis sufficiently to locate the tread of its associated tire at a location intersecting and overhanging the second axis;

(k) steering means interconnecting the first and second spindle members for pivoting the spindle members in unison about the first and second axes to steer the wheels;

(l) the first and second axes extending in a common plane inclined from the vertical, and each of these axes also extending in a separate vertical plane, the separate vertical planes being parallel and paralleling the forward-rearward dimension of the chassis;

(m) the chassis including first and second yoke structures, the first yoke structure having a pair of arms which define the first pair of mounting locations, and the second yoke structure having a second pair of arms which define the second pair of mounting locations;

(n) the spindle members each including an upper portion located near the upper arm of the associated yoke structure, a lower portion located near the lower arm of the associated yoke structure, and a connecting portion extending between and connecting the upper and lower portions, and a stub shaft supported at a central location on the connecting portion between the upper and lower portions, the associated wheel being journaled on the stub shaft;

(o) each of the tires having a center plane, and each of the king pin axes being located inwardly with respect to the chassis from the juncture of its associated tire center plane and its associated wheel rotation axis by a dimension of about 20 percent of the tread projection width of the associated tire;

(p) the king pin axes being inclined from the vertical within the range of about 5 to 15°; and,

(q) whereby, when the spindle members are turned to steer the wheels, the inclined orientation of the first and second axes causes the wheels to tilt into the turn to equal degrees and the inward spacing of the king pin axes causes the center of one of the tires to swing forwardly while causing the center of the other of the tires to swing rearwardly to a desired degree to improve vehicle turning performance.

---

**4,129,317**

**BICYCLE**

**Theodore F. Bell, 400 Fentress Blvd., Daytona Beach, Fla. 32015**

**Filed Mar. 5, 1976, Ser. No. 664,238**

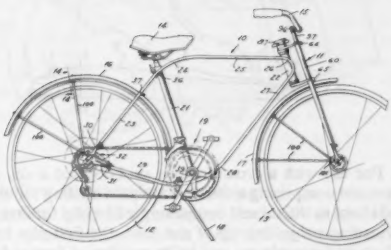
**Int. Cl.[2] B62K *3/04***

**U.S. Cl. 280—281 R** **16 Claims**

1. The method of making a bicycle frame comprising

forming a pair of substantially identical side frames which are mirror images of one another from a pair of lengths of tubular material of substantially constant cross section throughout by bending each said side length to form a first downwardly and rearwardly inclined straight portion, a second curved portion connected to said first portion and extending upwardly and forwardly and having a substantially constant radius, a third straight horizontal portion extending from said second portion forwardly, a fourth portion of substantially constant radius connected to the forward end of said third portion and extending forwardly and then downwardly and rearwardly, a fifth straight portion connected to said fourth portion and extending downwardly and rearwardly, a sixth curved portion connected to said fifth portion and having a substantially constant radius, and a seventh substantially straight portion connected to said sixth portion and extending upwardly and rearwardly to a free end, such that the free end of said first portion and the free end of said seventh portion are vertically spaced from one another,

connecting a crank housing tube to the lower end of a seat mast,



joining the upper end of said seat mast to said second portions of the pair of frames by brazing the seat mast to a bracket and the bracket to said frames without deforming the seat mast or second portions of the pair of frames,

joining the crank housing to the sixth portion of said pair of frames by brazing a bracket to said housing and said frames without deforming said bracket, said housing or said frames,

brazing a fork tube of substantially constant diameter between said fourth portions of said side frames without deforming said fork tube and said fourth portions.

---

**4,129,318**

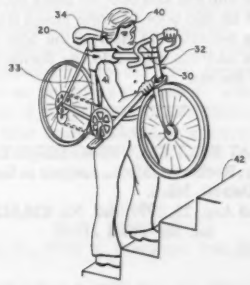
**BICYCLE CARRY AID**

**Charles A. Cahill, 567 Commonwealth Ave., Newton Center, Mass. 02159**

**Filed May 31, 1977, Ser. No. 802,044**

**Int. Cl.[2] B62J *39/00***

**U.S. Cl. 280—289 A** **7 Claims**




1. A carry aid for a bicycle which has a frame including a top tubular member and an adjoining seat tube, said aid comprising;

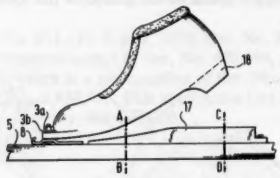
a cushion of resilient material adapted to be mounted upon the frame in the corner between the top tubular member and the seat tube, said cushion including on the outside thereof a first channel extending within said cushion and along the length thereof and arranged to engage said top tubular member and also on the outside thereof, a second channel extending within said cushion along the length thereof and angularly arranged with reference to said first channel, said cushion further including a yoke on its inside, shaped so as to enable a person to carry the bicycle on the shoulder.

**4,129,319**

## SKI BINDINGS

**Helmut Strohmeier, Kapfenberg, Austria, assignor to Hermann Kastinger, Austria**

**Filed Jul. 20, 1976, Ser. No. 706,943**
**Int. Cl.[2] A63C** *9/16, 11/16*
**U.S. Cl. 280—615** **19 Claims**




1. For use with a cross country ski boot and a ski, the improvement comprising a cross country ski binding for coupling the ski boot to the ski and comprising a first clip for attachment to a leading projecting tip of the boot, the first clip having a hook at its forwardmost end to be positioned forward of said boot tip and having a rearward end extending beneath the boot sole rearwardly of said boot tip, means for securing the first clip to the boot with said means being located rearwardly of said hook, said first clip having generally converging side edges with said edges converging in a direction extending towards the boot tip but underlying the boot, said securing means attaching said first clip to the boot only at the projecting tip of the boot, a second clip, means for rigidly securing the second clip to the ski, said second clip comprising a relatively flat piece of metal having opposite edges converging in a direction towards a forward tip end of the ski and claws extending upwardly from the edges away from the ski and inwardly in overlying retaining engagement with said converging side edges of said first clip and in slidable assembly relative to said claws, and a tensioning device mounted on said ski generally forward of both of said clips and engageable with said hooked end of said first clip and exerting a pull upon the first clip in a direction of the ski tip so that said first clip is pulled in between the claws of the second clip thus insuring a rigid connection between the first and second clips, the interengagement between the clips and the interengagement between said first clip and said boot tip being such as to permit the boot to pivot on said boot securing means free of said first and second clips whereby the heel of the boot can be lifted free of the clips and the ski while the forward boot tip is securely held to the ski.

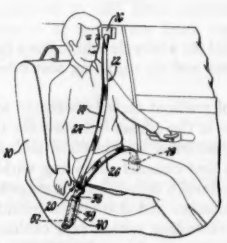
---

**4,129,320**

## SEAT BELT SECURING DEVICE

**Richard E. Fancy, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.**

**Filed Aug. 22, 1977, Ser. No. 826,642**
**Int. Cl.[2] B60R** *21/10*
**U.S. Cl. 280—744** **3 Claims**




1. In combination with a vehicle body adapted to support a seated occupant, a seat belt system having a belt and a securing device for releasably capturing the belt in a restraining position about the seated occupant, said securing device comprising: a mounting bracket mounted on the vehicle body; a C-shaped hook member having upper and lower legs spaced apart to define a belt receiving slot having a forward facing open end; pivot means acting between the mounting bracket and the hook member to mount the hook member for pivotal movement about an axis extending transversely of the vehicle body and between a belt capturing position wherein the legs and the slot extend in a downwardly direction and an open position wherein the legs and the slot extend in an upwardly direction to receive and release the belt; and spring means acting between the mounting bracket and the hook member and going overcenter upon movement of the hook member between the belt capturing position and the open position to selectively and alternately bias the hook member to the selected position.

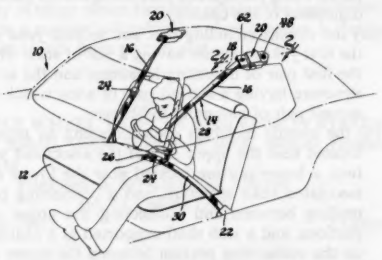
---

**4,129,321**

## SEAT BELT UTILIZATION RECORDER

**Louis P. Garvey, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.**

**Filed Sep. 9, 1977, Ser. No. 831,948**
**Int. Cl.[2] B62B** *35/00*
**U.S. Cl. 280—744** **1 Claim**




1. An anchorage device for attaching a seat belt on a vehicle body structural member and for providing a record of imposition of a predetermined occupant restraint load on the seat belt, said anchorage device comprising: a seat belt mounting member having the seat belt attached thereto; said mounting member having a generally planar surface having an aperture adapted to receive a fastener for attaching the mounting member on the structural member; said mounting member having a slot adjacent the aperture at a spaced relation therefrom to define a land surrounding the aperture, a load bearing wall spaced from the land, and an isthmus integral with the land and the generally planar surface and extending generally normal to the direction of seat belt load imposition on the mounting member; said isthmus having a predetermined limited load sustaining capability and being permanently deformed upon imposition of an occupant restraint seat belt load greater than the predetermined load sustaining capability of the isthmus to provide a permanent record of imposition of an occupant restraining load on the anchorage device and permit limited bodily shifting movement of the mounting member whereby the load bearing wall is carried into engagement with the land to block further movement of the mounting member and thereby anchor the seat belt for restraint of the occupant.

---

**4,129,322**

## SUPPORT DEVICE FOR A TRAILER

**Martin Kuntz, Jr., 800 - 7th St. NW., Austin, Minn. 55912**

**Continuation of Ser. No. 698,118, Jun. 21, 1976, abandoned.**
**This application Feb. 23, 1978, Ser. No. 880,574**
**Int. Cl.[2] B60S** *9/12*
**U.S. Cl. 280—766** **1 Claim**

1. A retractable and extensible type support device in combination with a mobile house type trailer having ground engaging wheels and having a compartment in the front portion thereof forwardly of the ground-engaging wheels, said com-

partment having an upper wall, a lower wall, and a removable front panel,

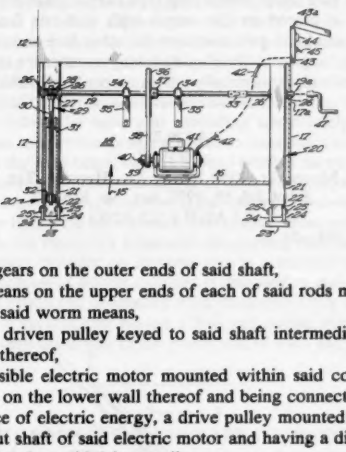
a pair of laterally spaced apart vertical leg structures disposed in said compartments, each leg structure including an elongate outer affixed tubular leg member positioned within said compartment and fixedly secured to the upper wall of the latter and each having an opened lower end, the lower end portion of each outer leg member projecting through the lower wall of the compartment, each leg structure including an elongate inner tubular leg member mounted within an outer leg member and being telescopically extensible and retractable relative to the latter, said lower leg members when extended engaging the ground to support the front end portion of the trailer,

a pair of internally threaded nut elements each being fixedly mounted in one of said inner leg members adjacent the upper end thereof,

a pair of bearings each being positioned within one of said inner leg members adjacent the lower end thereof,

a pair of vertically disposed elongate threaded rods each being journaled in bearing of one of said inner leg members and each threadedly engaging one of said nut elements, said rods when rotated in one direction causing said inner leg members to be extended, and when rotated in an opposite direction causing said inner leg members to be retracted,

an elongate horizontal shaft extending transversely through and journaled in the side walls of said compartment, said shaft having a universal joint intermediate its ends,



worm gears on the outer ends of said shaft,

gear means on the upper ends of each of said rods meshing with said worm means,

a large driven pulley keyed to said shaft intermediate the ends thereof,

a reversible electric motor mounted within said compartment on the lower wall thereof and being connected to a source of electric energy, a drive pulley mounted on the output shaft of said electric motor and having a diameter smaller than said driven pulley,

an endless belt trained bout said drive and driven pulleys,

a pair of pillow bearings mounted within said compartment and being positioned closely adjacent said driven pulley on opposite sides thereof to revolvably support said shaft,

a control panel mounted on a side wall of the trailer adjacent said compartment, a cover for said control panel,

a directional control switch mounted on said control panel and being disposed in controlling relation with respect to said motor and controlling the direction of drive of the latter,

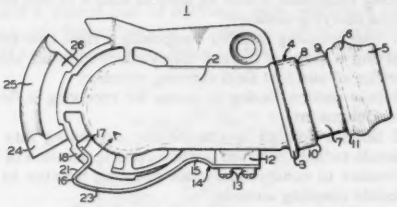
a master switch mounted on said control panel and being disposed in controlling relation with said electric motor and with said directional switch and being shiftable between on and off positions, said master switch when shifted to the on position energizing said motor to thereby cause said rods and associated inner leg members to be extended or retracted.

**4,129,323**

## LOCKABLE HOSE COUPLING

**Richard L. Wilson, Monroeville, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.**

**Filed Jul. 14, 1977, Ser. No. 815,618**
**Int. Cl.[2] B60D *1/08*; B61G *5/08*; F16L *37/12***
**U.S. Cl. 285—69** **5 Claims**



1. A hollow hose coupling comprising:

(a) a hollow body having integral therewith an arcuate lip with a lip bead on which is formed a lip bearing surface and a first guard arm having a guard arm groove for receiving therein the lip bead of a second one of a pair of coupled hose couplings, wherein the improvement comprises:

(b) a mounting boss fixed to the outside of said hollow body, and

(c) a leaf spring locking member mounted by one end thereof on said mounting boss and having formed intermediate the ends thereof a substantially S-shaped portion normally disposed generally parallel to the side of and out of contact with said body, said leaf spring locking member having formed on the other end thereof a stop that is shiftable by a second guard arm of said second one of said pair of hose couplings out of the pathway of said second guard arm as said second guard arm is rotated toward the fully coupled position of the pair of hose couplings, the configuration of said stop being such and responsive to the resiliency of said leaf spring locking member that, upon attainment of said fully coupled position, in which said second guard arm moves out of contact with said stop, said stop is moved into the pathway of said second guard to inhibit relative rotation of the hose couplings and consequent undesirable uncoupling thereof,

(d) said S-shaped portion and stop being yieldingly movable, upon application of manual force thereon, toward said body and an unlocking position in which said stop is moved out of the pathway of said second guard arm so that said hose couplings may be relativey rotated to an uncoupled disposition.

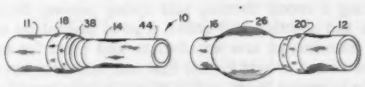
---

**4,129,324**

## TUBE COUPLING

**Earl O. Jones, Jr., 1424 S. Evergreen Ave., Clearwater, Fla. 33516**

**Filed Jun. 3, 1977, Ser. No. 803,215**
**Int. Cl.[2] F16L *17/00***
**U.S. Cl. 285—107** **8 Claims**



1. A fluid coupling apparatus adapted for connecting and disconnecting a first and a second fluid carrying member, comprising in combination:

a male and a female coupling member adapted for connec-

tion to the first and the second fluid carrying member respectively;

said female coupling member comprising a first and a second conduit portion having a first and second cross-sectional area respectively;

a female radially enlarged portion including a bulge interposed between said first and second conduit portions;

said second conduit portion of said female coupling member being receivable within an internal orifice of said second fluid carrying member;

said male coupling member comprising a rigid base section having a portion thereof receivable within an internal orifice of said first fluid carrying member;

said base section having a recess for receiving a flexible conduit means;

said flexible conduit means radially expanding into said female radially enlarged portion upon application of fluid pressure to connect said male coupling member to said female coupling member;

said flexible conduit means comprising resilient wall means being movable between a contracted and a radially expanded position; and

said resilient wall means being normally biased in the contracted position to radially expand only upon application of fluid pressure and to radially contract from said radially expanded position within said female radially enlarged portion upon termination of fluid pressure to enable disconnection of said male coupling member from said female coupling member.

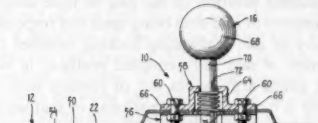
---

**4,129,325**

## DOOR LATCH

**John F. Hern, Southfield, and Joseph L. Buccellato, Warren, both of Mich., assignors to Massey-Ferguson Inc., Detroit, Mich.**

**Filed Jul. 8, 1977, Ser. No. 813,906**
**Int. Cl.² E05C *3/30***
**U.S. Cl. 292—127** **2 Claims**



1. A latch device comprising: a handle, inner and outer panels of an enclosure wall for supporting said handle, first and second spaced apart ends on said handle straddling said wall, said handle including a rod portion intermediate said handle ends and slidable relative to said panels, a spring attached to said handle rod portion biasing said handle relative to said panels and located therebetween, a collar on said inner panel covering a recess therein, said spring passing through said recess and abutting said collar, a pawl pivotal on said outer panel exterior, an arm attached to said pawl for movement therewith and to said handle first end, said arm having a slot therein to permit linear motion of said handle in said mounting means operative to actuate pivotal movement of said pawl to engage and disengage a detent, said handle second end manually operative from one side of said wall on said pawl located on the opposite side of said wall to cause engagement of the detent by said pawl and a seal located between said handle rod portion and said outer panel to prevent passage of dirt and noise therepast while still permitting said handle to slide within said outer panel.

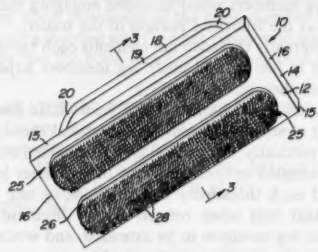
---

**4,129,326**

## CARPET LIFTING METHOD AND APPARATUS

**Frederick Weck, III, 316 Chestnut Dr., Lanoka Harbor, N.J. 08734**

**Filed Sep. 8, 1977, Ser. No. 831,375**
**Int. Cl.² E04F *21/20***
**U.S. Cl. 294—8.6** **6 Claims**



1. A carpet lifter comprising a generally planar backing member having opposite faces, a hook type fastener fabric secured on one face of said backing member with the hooks away from said backing member and having their concave sides facing toward the backing member, for releasable holding action of said fabric with a loop type carpet when the backing member is placed on the carpet with said one face downwardly, and hand grip means on the other face and extending generally longitudinally of said backing member for raising the latter generally horizontally with a carpet being held thereby.

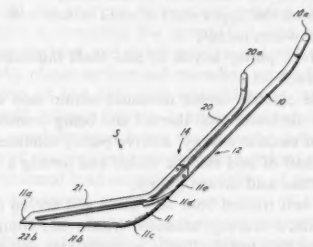
---

**4,129,327**

## SHOVEL

**Claud T. Moore, Jr., 3803 Botany La., Houston, Tex. 77047**

**Filed Jul. 18, 1977, Ser. No. 816,297**
**Int. Cl.² A01B *1/22*; B25G *3/00***
**U.S. Cl. 294—58** **4 Claims**



1. A new and improved shovel, comprising:

a main handle member;

a shovel blade connected on one end to said main handle member and having an opposite, open end for initially engaging the ground to scoop up dirt or the like; and

an auxiliary handle assembly attached to said shovel blade at said opposite, open end thereof and extending adjacent to and along said main handle member and terminating in an auxiliary handle end portion unconnected to said main handle member for cooperating with said main handle member through said attachment at said shovel blade open end to lift and maneuver a load of dirt or the like in said shovel blade;

a shovel connector means and an auxiliary handle member attached to said shovel connector means, said shovel connector means connecting said auxiliary handle to said shovel blade at said opposite, open end thereof in a non-pivotal connection;

said shovel blade being substantially rectangular in configuration and including raised side edges in a U-shape extending from the said one end of said shovel blade to said opposite, open end; and

said shovel connector means being positioned above and extending along said raised side edges of said shovel blade into connection with said shovel blade at said opposite, open end thereof.

---

**4,129,328**

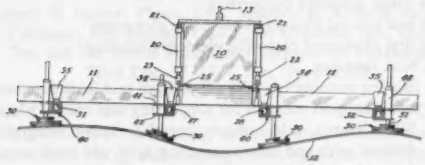
## PLATE HANDLING APPARATUS WITH LOAD DEFLECTION COMPENSATION

**Edmund R. Littell, 1626 W. North Shore, Chicago, Ill. 60626**

**Filed Jun. 20, 1977, Ser. No. 807,978**

**Int. Cl.² B66C *1/02***

**U.S. Cl. 294—65** **2 Claims**



1. In a vacuum plate lifter, the combination with a power body portion adapted to be suspended from a crane or the like, a load beam pivotally supported by the body portion, an hydraulic power cylinder carried by the body portion and having a depending piston rod which is operatively connected to the load beam for bodily rotating the load beam around its pivot axis, a plurality of cross arms carried by the load beam by being disposed below the same and extending transversely of the load beam, respective bracket means connecting each cross arm with the load beam, certain of said bracket means having slidable movement along the length of the load beam, whereby the cross arm supported thereby is also slidable, a power cylinder of the hydraulic type at each end of each cross arm, additional bracket means for adjustably supporting each last mentioned power cylinder on its cross arm in a manner whereby the last mentioned power cylinder is disposed at right angles and has a piston rod depending from its downwardly directed end, and a suction cup having a ball and socket connection with the depending end of the piston rod of each such power cylinder.

---

**4,129,329**

## SELF-POWERED BUCKET ARRANGEMENT

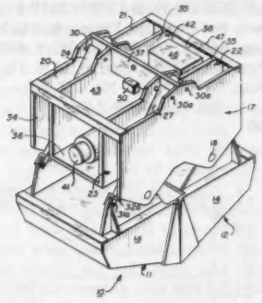
**Joseph F. Longo, Wilton, Conn., assignor to International Dynetics Corporation, South Norwalk, Conn.**

**Filed Mar. 7, 1977, Ser. No. 775,207**

**Int. Cl.² B66C *3/02***

**U.S. Cl. 294—70** **9 Claims**

1. A self-powered bucket arrangement comprising a first bucket bowl and a second bucket bowl, and a power head frame pivotally mounting said first and second bowls for pivoting to an open position for the reception of material therein and to a closed position for transporting the material to a desired site, said power head frame having a first and a second exterior parallel side walls, a first and a second intermediate side walls parallel to and spaced from said exterior side walls, a bottom wall integrally connecting said intermediate side walls, and a transversely extending center plate integrally connected to each of said exterior and intermediate side walls along the upper edge thereof, said center plate dividing said power head frame into a first and second longitudinal half, said first and second bucket bowls being pivotally connected respectively to the first and second longitudinal halves, each of said longitudinal halves having a plurality of compartments at least one compartment being defined by said first exterior side wall, said center plate and said first intermediate side wall, at least one compartment being defined by said second exterior side wall, said center plate and second intermediate side wall and at least one compartment being defined by said first and second intermediate side walls, said bottom wall and said center plate, a first and a second pair of hydraulic rams positioned respectively in said first and second longitudinal halves one hydraulic ram of each of said pairs being located in the compartment



formed between the first exterior and intermediate side walls and the other hydraulic ram of each of said pairs being located between the second exterior and intermediate side walls, each of said first pair of hydraulic rams having a first end pivotally connected to said center plate and a second end pivotally connected to said first bucket bowl, each of said second pair of hydraulic rams having a first end pivotally connected to said center plate and a second end pivotally connected to said second bucket bowl, and a plurality of power components housed in the remaining compartments of said power head frame.

---

**4,129,330**

## UNDERSTRUCTURE OF A SELF-SUPPORTING MOTOR VEHICLE BODY

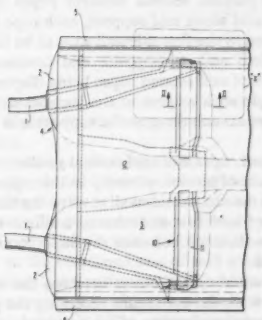
**Norbert Schwuchow, Sindelfingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany**

**Filed Jun. 16, 1976, Ser. No. 696,690**

**Claims priority, application Fed. Rep. of Germany, Jun. 19, 1975, 2527385**

**Int. Cl.² B62D *27/02***

**U.S. Cl. 296—28 F** **10 Claims**



1. An understructure of a self-supporting motor vehicle body, which comprises two longitudinal bearer means initially extending approximately parallel to the vehicle longitudinal

direction at a distance from one another, said longitudinal bearer means being connected with the outside of an end wall of said vehicle body, said longitudinal bearer means extending at their inner ends outwardly in the direction toward two outer longitudinal bearers and being directly connected to said outer longitudinal bearers, characterized in that a wall section of the longitudinal bearer means forms a wall section of the periphery of the outer longitudinal bearer as viewed in transverse cross-section within the area of the connection of the longitudinal bearer means and of the outer longitudinal bearer.

---

**4,129,331**

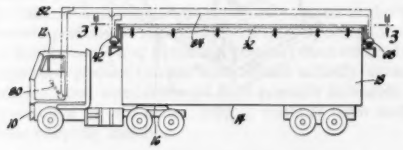
## RETRACTABLE COVER FOR OPEN TOP CONTAINER

**Herman L. Lawson, 664 Coolidge, Plymouth, Mich. 48170, and Norbert D. Lang, 4640 Hunt, Wayne, Mich. 48184**

**Continuation of Ser. No. 732,960, Oct. 15, 1976. This application Aug. 17, 1977, Ser. No. 825,217**

**Int. Cl.[2] B60P *7/04***

**U.S. Cl. 296—100** **3 Claims**



1. In combination with a vehicular container having a first sidewall, a second sidewall spaced with respect to the first sidewall, and a pair of end walls cooperating with the sidewalls to define an open top, cover means comprising:

a cover of flexible material having a width accomodating the distance between said container sidewalls, and a length accomodating the distance between the container end walls, and means connecting one side of the cover to the first sidewall;

an elongated substantially rigid support member connected to the opposite side of the cover so as to be movable therewith between an open position adjacent the first sidewall, and a closed position adjacent the second sidewall, the support being mounted on the container in a position parallel to the first sidewall;

power means connected to the support for moving it between said open position and said closed position;

a plurality of parallel first resilient ropes disposed at spaced positions along said support, each rope having one end connected to the first sidewall so as to be fixed against motion thereto and its opposite end connected to the support so as to form an acute angle therewith at such times as the support is disposed in said closed position;

a plurality of parallel second resilient ropes disposed at spaced positions along said support, each rope having one end connected to the first sidewall so as to be fixed against motion thereto and its opposite end connected to the support, each of said second ropes being disposed to form an acute angle with respect to the support so as to cross the first ropes at such times as the support is in said closed position;

said first resilient ropes and said second resilient ropes each being in a state of tension whereby as the support is being moved from the second sidewall toward the first sidewall, the tension of said first and second resilient ropes is reduced as the distance between the support and the first sidewall; and

eye means mounted on the cover between the support and the first sidewall, the eye means receiving the plurality of first ropes and the plurality of second ropes such that as the support is being moved by the power means from said closed position toward said open position, the flexible cover is moved from a substantially planar position toward a substantially pleated position.

**4,129,332**

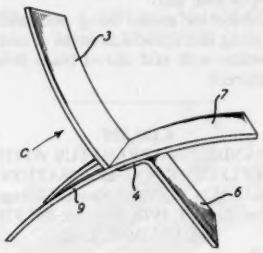
## CHAIR MADE OF TWO PLATE-LIKE ELEMENTS

**Steffen Hoeholt, Vordingborg, Denmark, assignor to Dehn Holding A/S, Aislev, Denmark**

**Filed Aug. 15, 1977, Ser. No. 824,545**

**Int. Cl.[2] A47C *7/00***

**U.S. Cl. 297—440** **7 Claims**



1. A chair assembly comprising:

first and second elongated plate-like elements;

said first elongated plate-like element including

a back member,

a first leg member laterally offset from said back member, and a support member for supporting said second plate-like element, said support member being integrally formed with and interconnecting with said back member and said first leg member,

said back member at its interconnection with said support member being wider than said support member to thereby define at the lower edge of said back member at opposite sides and at the outer extremities thereof shoulder means to provide bearing points for portions of said second plate-like element in the chair assembly;

said second plate-like element including

a seat member,

a pair of leg members integrally formed with and as an extension of said seat member, said pair of leg members closely embracing said support member at each end of said support member, each of said leg members in the assembly bearing against said shoulder means,

the rear portion of said seat member resting on said support member in the chair assembly; and locking means interengaging said first and second plate-like elements for locking said plate-like elements together in the assembly, said locking means comprising means formed on one of said first and second plate-like elements for engaging the other of said plate-like elements.

---

**4,129,333**

## TIP-UP VEHICLES

**Archibald W. Kidd, Seend Close Seend, Melksham, Wiltshire, England**

**Filed Jan. 20, 1976, Ser. No. 650,608**

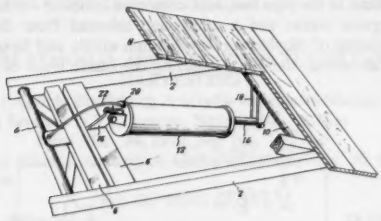
**Claims priority, application United Kingdom, Jan. 29, 1975, 3999/75**

**Int. Cl.[2] B60P *1/04***

**U.S. Cl. 298—22 R** **6 Claims**

1. Tip-up dumping trailer having a chassis, a tipping body, a ram for raising and lowering said body, a pivotally mounted hydraulic cylinder the interior of which is divided into first and second compartments by a piston working therein and coupled to operate the ram, the first compartment on one side of the piston being filled with fluid to act directly on the piston to operate the ram in the body raising direction, the second compartment on the other side of the piston being closed to the atmosphere and containing a quantity of air or other gas which

is continuously compressed and expanded by the piston throughout the movement of the piston and the attendant



movement of the tipping body, and provides a pneumatic force to act directly on the piston to assist the lowering of said body.

---

## 4,129,334
## METHOD FOR LOCATING THE REMAINING RECOVERABLE MINERAL RESERVES DURING SOLUTION MINING

**Dennis E. Stover, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.; NM Uranium, Inc., Houston, Tex. and The United States Steel Corporation, Pittsburgh, Pa.**

**Filed Dec. 27, 1977, Ser. No. 864,352**
**Int. Cl.[2] E21B *43/28***
**U.S. Cl. 299—4** **8 Claims**

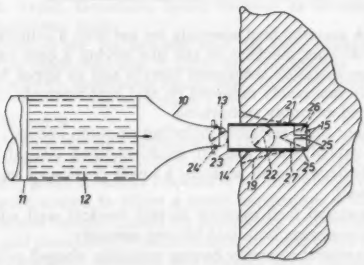
1. A method for locating the remaining mineral reserves recoverable via solution mining from a subterranean formation containing said mineral in which an injection and production well are drilled and completed within said formation, leach solution and an oxidant are injected through said injection well into said formation to dissolve said mineral, and said dissolved mineral is recovered via said production well, which comprises temporarily ceasing said injection of oxidant and measuring the change in mineral concentration in the solution recovered via said production well.

---

## 4,129,335
## FLUID JET METHOD AND DEVICE FOR BREAKING HARD MATERIAL

**Erik V. Lavon, Saltsjö-Boo, Sweden; Bo Lemcke, Lausanne, Switzerland, and Levi J. Karlfors, Nacka, Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden**

**Filed Aug. 27, 1976, Ser. No. 718,421**
**Claims priority, application Sweden, Sep. 19, 1975, 7510560**
**Int. Cl.[2] E21C *37/12***
**U.S. Cl. 299—17** **22 Claims**



1. A method of breaking a hard compact material, such as rock comprising:

mechanically drilling a substantially cyclindrical blind hole in the material to be broken, said material having free surfaces adjacent said hole;

extending a tubular member into said hole from outside said hole, said tubular member having an open forward end which faces the bottom of said hole;

generating a high velocity jet of substantially incompressible fluid through a nozzle having an internal cavity which has a converging contour leading to a nozzle exit area, the smallest cross sectional dimension of said jet being between 30–100% of the free cross sectional diameter of said tubular member; and

directing said jet from said nozzle exit area and through said tubular member toward the bottom of said hole so as to be suddenly arrested upon impact with said hole bottom after having traversed said tubular member to create a jet stagnation pressure in said hole, stemmed by said tubular member, to break said material toward said adjacent free surfaces of said material.

12. Apparatus for breaking a hard compact material, such as rock, having a substantially cylindrical blind hole formed therein, comprising

a nozzle having an internal cavity which has a converging contour leading to a nozzle exit area;

means operatively associated with said nozzle to emit a massive high velocity jet of substantially incompressible fluid from said nozzle exit area; and

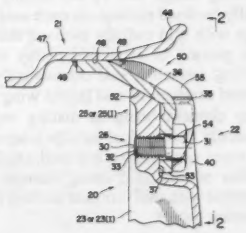
a tubular fluid directing and stemming member operatively associated with said nozzle to receive said jet from said nozzle exit area, said tubular member being in alignment with said nozzle and said hole, said tubular member at least partially extending into said hole from outside said hole and extending further into said hole than said nozzle exit area, and having an open forward end facing the bottom of said hole, said tubular member having interior surface means for receiving and directing said jet from said nozzle exit area toward said bottom of said hole upon said jet having traversed said tubular member.

---

## 4,129,336
## BASE FLANGED TIRE CARRYING RIM AND WHEEL

**William D. Walther, Kettering, Ohio, assignor to Dayton-Walther Corporation, Dayton, Ohio**

**Continuation-in-part of Ser. No. 592,502, Jul. 9, 1975, abandoned. This application Dec. 13, 1976, Ser. No. 749,243**
**Int. Cl.[2] B60B *23/10***
**U.S. Cl. 301—12 R** **4 Claims**



1. A combination of dual inner and outer tire carrying rims seated and locked by fastening means and assemblies on a vehicle wheel,

said wheel having a plurality of inner and outer spoke members, each of said inner spoke members having a felloe comprising axially oriented and radially inclined surfaces and a radially directed surface extending inwardly from each of said axially oriented surfaces substantially perpendicular to the rotational axis of said wheel and providing a mounting location for an axially projecting component of said inner rim fastening means, each of said outer spoke members having a felloe comprising spaced-apart axially projecting wing portions providing outwardly facing dual axially oriented surfaces and a radially directed surface oriented transversely between said axially oriented surfaces substantially perpendicular to the rotational axis of

said wheel and providing a mounting location for an axially projecting component of said outer rim fastening assemblies,

each of said rims having radially outwardly directed bead flanges and radially inwardly projecting mounting flanges, each of said mounting flanges having a radially outer portion, a medial portion, a transitional portion and a radially inner terminal portion, said radially outer flange portion being integrally attached to and mounted beneath a conforming annular surface on a base portion of said rim at a predetermined axial location between said bead flanges, said medial portion of said mounting flange being connected to said radially outer portion and directed inwardly away from said rim and comprising a radially inclined surface, said transitional portion of said mounting flange being functionally connected between said medial and terminal portions, said terminal portion of said mounting flange being radially directed,

said terminal portion of a mounting flange on said inner rim having a bore therein for receiving said axially projecting component of said inner rim fastening means, said terminal portion of a mounting flange on said outer rim having a bore therein for receiving said axially projecting component of said outer rim fastening assemblies,

each of said outer rim fastening assembly comprising a threaded fastener and a clamp element supported by said threaded fastener, each said clamp element having lateral wing portions providing downwardly facing dual axially oriented surfaces, an axially inwardly directed member and a radially outer portion comprising a radially inclined surface,

whereby, said inner rim is seated on, and thereafter locked on, said inner spoke members by tightening of said inner rim fastening means and the mating engagement of said radially inclined surface on each said inner spoke felloe with said radially inclined surface on each said inner rim mounting flange and by the mating engagement of said radially directed surface on each said inner spoke felloe with said terminal portion of each said inner rim mounting flange, and,

whereby, said outer rim is seated on, and thereafter locked on, said outer spoke members by tightening of said outer rim fastening assemblies and the mating engagement of said radially directed surface on each said outer spoke felloe with said terminal portion of each said outer rim mounting flange, and by the mating engagement of said radially inclined surface on each said outer rim mounting flange with said radially inclined surface on said radially outer portion of each said clamp element of each said fastening assembly, said downwardly facing dual axially oriented surfaces on said lateral wing portions of each said clamp element being in mating engagement with said outwardly facing dual axially oriented surfaces on each said outer spoke felloe and said axially inwardly directed member of each said clamp element being in mating engagement with said terminal portion of each said outer rim mounting flange.

---

**4,129,337**

## METHOD FOR PREVENTING EROSION-CORROSION OF HYDRAULIC CAPSULE TRANSPORTATION APPARATUS

**Nobuyoshi Hosaka; Yuichi Ishikawa, both of Ibaraki; Osamu Nishida, Saitama, and Masakatsu Sakamoto, Matsudo, all of Japan, assignors to Hitachi, Ltd., Japan**

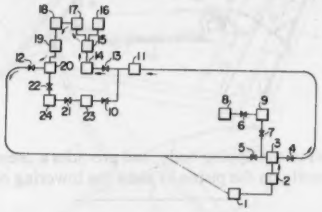
**Filed Jul. 7, 1976, Ser. No. 703,236**

**Claims priority, application Japan, Jul. 9, 1975, 50-83482**

**Int. Cl.² B65G *51/04***

**U.S. Cl. 302—2 R** **11 Claims**

1. A method for preventing erosion-corrosion of a hydraulic metallic capsule transportation apparatus, which comprises depositing straight chain, macromolecular polyethylene oxide having a molecular weight larger than $10^4$ directly onto surfaces of metallic capsules to be introduced into a fluid in a pipe line, thereby reducing a fluid resistance of the metallic capsules and reducing damages due to contact of the metallic capsules with inner walls of the pipe line, adding a corrosion inhibitor to the fluid in the pipe line, said corrosion inhibitor containing an inorganic nitrite and a compound selected from the group consisting of dicyclohexylammonium nitrite and hexamethylene tetramine, thereby protecting the inside walls of the pipe



line and the surfaces of the metallic capsules from corrosion, and depositing the corrosion inhibitor at a higher concentration onto the surfaces of the metallic capsules after a material to be transferred is discharged from the metallic capsules but before the metallic capsules are exposed to the atmosphere, thereby protecting the metallic capsules from corrosion in the atmosphere.

---

**4,129,338**

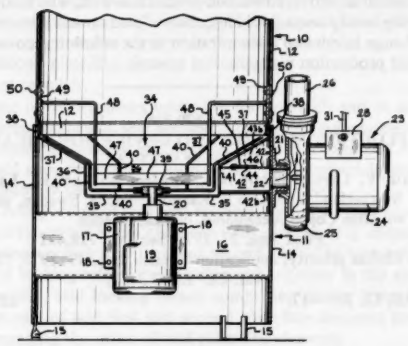
## CELLULOSIC INSULATION BLOWING MACHINE

**Donald F. Mudgett, St. Marys, Ohio, assignor to U.S. Fiber Corporation, Delphos, Ohio**

**Filed Aug. 4, 1977, Ser. No. 821,693**

**Int. Cl.² B65D *83/06***

**U.S. Cl. 302—2 A** **14 Claims**



9. A material feed assembly for use with a cellulosic insulation blowing machine or the like having a base assembly, a blower assembly connected thereto and an upper hopper assembly removably mounted on said base assembly, said material feed assembly comprising

a floor plate assembly including an outer, annular, generally vertical wall, and an interconnected central generally horizontal wall adjacent a lower portion of said vertical wall,

a material feed opening in said vertical wall adapted for connection with said blower assembly,

an agitator assembly having rotatable, shaped radial means supported centrally of said floor plate assembly and in spaced overlying relationship thereto, said radial means being contoured correspondingly to the cross-section of said floor plate assembly and generally parallel thereto in operating position, and

an anti-spin bar member in overlying and inwardly spaced relationship with said radial means of the agitator assembly, said anti-spin member when in its operating position

being stationary with respect to said radial means, and adjacent said material feed opening of the floor plate assembly.

---

**4,129,339**

## TRASH REMOVAL APPARATUS FOR SUGAR CANE HARVESTERS

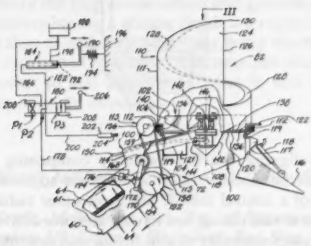
**Donald J. Quick, Bundaberg, Australia, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles**

**Filed Mar. 24, 1977, Ser. No. 780,746**

**Claims priority, application United Kingdom, Mar. 30, 1976, 12819/76**

**Int. Cl.² B65G *53/14***

**U.S. Cl. 302—21** **13 Claims**



1. Trash removal apparatus for harvesters of sugar cane or similar crops comprising:

a support structure; and

an axial flow fan mounted on said support structure the fan having fan blades rotatable about a fan axis;

characterized by

a helical trash guide member located on the pressure side of said axial flow fan said helical trash guide member comprising a smoothly curved wall leading to a trash discharge edge, said wall extending round the fan axis, and a helical flange carried by said smoothly curved wall and projecting inwardly therefrom; and by

said helical trash guide member being mounted on said support structure for pivotal movement about a pivot axis close to or coaxial with the fan axis; and by

thrust means connected to said helical trash guide member and capable of effecting pivotal movement about said pivot axis.

---

**4,129,340**

## CONTROL DEVICE FOR A PNEUMATIC BRAKING SYSTEM

**Ramon B. Trenc, Barcelona, Spain, assignor to Bendibercia, S.A., Barcelona, Spain**

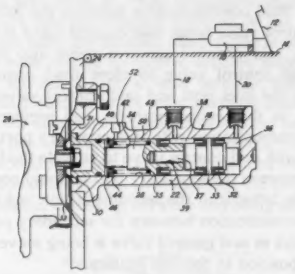
**Continuation of Ser. No. 665,368, Mar. 10, 1976, abandoned. This application Jun. 2, 1977, Ser. No. 802,932**

**Claims priority, application Spain, Mar. 13, 1975, 435576**

**Int. Cl.² B60T *13/00***

**U.S. Cl. 303—6 R** **6 Claims**

2. In a vehicle having a chassis and a cab pivotally mounted on said chassis, a braking system including a pneumatic pressure source, brake actuators responsive to fluid pressure from said pressure source to effect a brake application, a control valve mounted on said chassis for controlling communication between said pneumatic pressure source and said brake actuators, and means for actuating said control valve including a hydraulic master cylinder mounted on said cab, a hydraulic receiver cylinder mounted on said chassis and operatively connected to said control valve, said receiver cylinder including a housing defining a bore therewithin, piston means slidably mounted in said bore, said piston means cooperating with the wall of said bore to define a fluid-receiving chamber therebetween, means interconnecting the piston means and the control valve to transmit movement of the piston means to the control valve so that movement of the piston means actuates the control valve, and flexible conduit means communicating said master cylinder with said chamber, said flexible conduit means accommodating the pivotal movement between the cab and the chassis, said master cylinder being a tandem unit generating first and second hydraulic pressures, said piston means including first and second pistons dividing said chamber into a first compartment defined between said first and second pistons and a second compartment defined between an end of said



second piston and an end of said bore, said flexible conduit means including a pair of flexible hoses, each of said hoses communicating one of the first and second fluid pressures generated by the master cylinder to a corresponding one of said first and second compartments, said interconnecting means including a bell slidable in said bore and located between said first piston and said control valve, and a venting port in the wall of said bore venting the cavity defined between the bell and said first piston.

---

**4,129,341**

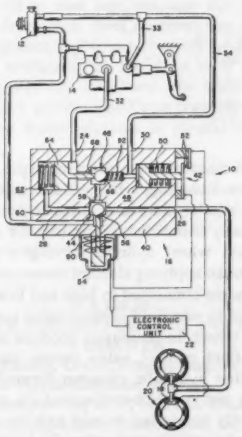
## MODULATOR VALVE ASSEMBLY FOR A FLUID BRAKING SYSTEM

**Edward M. Pauwels, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.**

**Filed Mar. 28, 1977, Ser. No. 781,914**

**Int. Cl.² B60T *13/18***

**U.S. Cl. 303—6 R** **5 Claims**




1. A modulator valve having an inlet port for fluid communication with a brake booster, an outlet port for fluid communication with a wheel cylinder, a secondary port for fluid communication with a pressure source, and a return port for fluid communication with a reservoir, said modulator valve comprising:

a housing defining the inlet port, the outlet port, the secondary port, and the return port therein;

a control valve cooperating with said housing in a first position to provide fluid communication between the inlet port and the outlet port, said control valve being movable to a second position closing fluid communication between said inlet port and said outlet port and providing fluid communication between the outlet port and the return port; and

a pressure sensitive valve cooperating with said housing to provide fluid communication between the inlet port and said control valve when said control valve is in the first position, said pressure sensitive valve also cooperating with said control valve to close fluid communication between the inlet port and said control valve when the latter is in the second position, said pressure sensitive valve communicating with the secondary port and cooperating with said control valve to provide fluid communication between the secondary port and said control valve when the latter is in the second position and to provide fluid communication between the secondary port and the outlet port as said control valve is being moved from the second position to the first position.

---

**4,129,342**

## ANTI-SKID BRAKE CONTROL DEVICE

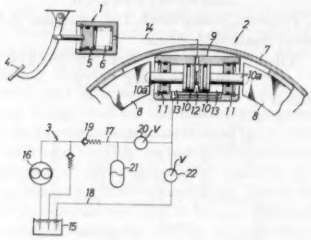
**Makoto Sato, Kamifukuoka; Hiroshi Takamatsu, Ohimachi; Yoshitaka Miyagawa, Kawagoe, and Etsuo Fujii, Wako, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Jan. 25, 1977, Ser. No. 762,782**

**Claims priority, application Japan, Jan. 29, 1976, 51-8682; Feb. 2, 1976, 51-10195; Feb. 16, 1976, 51-15607**

**Int. Cl.[2] B60T *8/08***

**U.S. Cl. 303—105** **2 Claims**



1. An improved anti-skid brake control system for use with wheeled vehicles including, a brake fluid pressure producing unit; a wheel cylinder associated with a vehicle wheel and being hydraulically connected to said unit for application of a brake force, said wheel cylinder having a piston slidable therein with a brake applying element connected thereto, fluid control valve means connected to high and low pressure lines; means connected to said fluid control valve means for sensing locking of said wheel, to thereupon produce an output signal actuating said fluid control valve means, the improvement comprising: a first hydraulic chamber formed in said wheel cylinder with a piston member disposed on one side thereof and being directly connected to said unit for applying a hydraulic pressure to said piston member for brake application; a second hydraulic chamber formed in said wheel cylinder by said piston member on the opposite side thereof, being connected with said high and low pressure lines through said fluid control valve means, for applying a regulated hydraulic pressure to said piston member for counteracting hydraulic pressure applied thereto.

**4,129,343**

## UNITARY SELF-ALIGNING BEARING ASSEMBLY

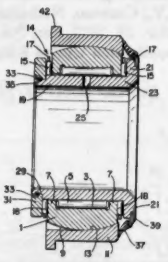
**Pierre A. Janssen, Grisy Les Platres, France, assignor to Nadella, Rueil Malmaison, France**

**Filed Oct. 12, 1977, Ser. No. 841,392**

**Claims priority, application France, Oct. 22, 1976, 76 31880**

**Int. Cl.[2] F16C *23/00***

**U.S. Cl. 308—35** **8 Claims**



1. A self-aligning bearing assembly comprising a casing having an internal concave spherical surface adjacent one end on one side of a central medial plane, an outer radial bearing ring mounted in said casing and having an outer convex spherical surface complementary to and fitting said internal concave surface on said casing, an inner radial bearing ring within said outer radial bearing ring, and roller type bearings between said rings, said outer radial bearing ring having radial end faces and said inner radial bearing ring having radial back plates fixed on its ends opposed to and axially spaced from said radial end faces on said outer radial bearing ring so that each end face of said outer radial bearing ring and the corresponding radial back plate on said inner radial bearing ring form bearing races, and thrust bearings between the bearing races, each of said thrust bearings having a bearing cage carried by a radial end face, and a seal fixed on one of the back plates of said inner bearing ring and extending to and engaging said one end of said casing to form a seal for the thrust bearing engaging said one of said back plates.

---

**4,129,344**

## BEARING RACE RING WITH LUBRICANT AND COOLING CHANNELS

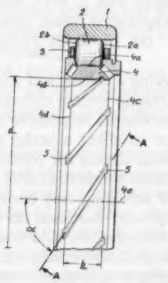
**Karl Hörmann, Dittelbrunn, and Hans Weigand, Schweinfurt, both of Germany, assignors to Kugelfischer Georg Schäfer & Co., Schweinfurt, Germany**

**Filed Sep. 30, 1976, Ser. No. 728,191**

**Claims priority, application Fed. Rep. of Germany, Dec. 12, 1975, 2555923**

**Int. Cl.[2] F16C *1/24***

**U.S. Cl. 308—187** **5 Claims**



1. A bearing ring comprising a circular body having a pair of

axial ends, an inner surface and an outer surface opposite said inner surface, one of said surfaces having a configuration constituting a race for rolling elements of a bearing, the other of said surfaces being formed with a multiplicity of spaced-apart grooves inclined to the axis of said ring and running substantially from one end to the other end thereof, each groove terminates at a level substantially identical to that at which a successive one begins, said grooves are inclined at an angle $\alpha$ to the axis of said ring, said angle $\alpha$ being defined by the formula:

$$\tan \alpha = \frac{d \cdot \pi}{n \cdot b}$$

wherein d is the diameter of said other surface, n is the number of grooves circumferentially spaced therearound and b is the axial width of the ring across which said grooves extend, each of said grooves having a greater depth at a region intermediate said ends than at said ends, said body being bipartite and consisting of two halves adjoining along a median plane of the ring perpendicular to said axis, the grooves in said halves being inclined in opposite directions.

---

**4,129,345**

## BEARING ASSEMBLY FOR A MOTOR VEHICLE WHEEL

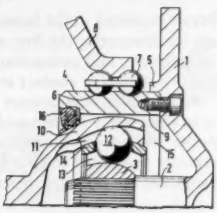
**Werner Krude, Meisenweg, Fed. Rep. of Germany, assignor to Uni-Cardan AG, Lohmar, Rheinland, Fed. Rep. of Germany**

**Filed Dec. 13, 1976, Ser. No. 750,167**

**Claims priority, application Fed. Rep. of Germany, Dec. 13, 1975, 2556244**

**Int. Cl.**[2] **B60B** *27/00;* **B60K** *17/22*

**U.S. Cl. 308—191** **9 Claims**



1. A bearing assembly for a motor vehicle wheel comprising an outer bearing ring attached to a wheel support and an inner bearing ring, said inner and outer bearing rings being spaced radially and having bearing elements therebetween to define a bearing assembly, a wheel hub attached to said inner bearing ring, a constant velocity universal joint having outer and inner joint members, said inner bearing ring having an outer peripheral surface and a bore therethrough with a diameter at least equal to the outer diameter of said outer joint member, said outer joint member being disposed within said bore of said inner bearing ring, a shaft extending from said wheel hub and connected to said inner joint member so that said wheel hub and inner bearing ring are rigidly connected to said inner joint member, and an annular flange on said wheel hub engaging one of said outer peripheral surface and bore of said inner bearing ring to center said hub with respect to said inner bearing ring.

---

**4,129,346**

## PAINT AND TOOL CASE

**Bernard L. Hofman, 340 Galena Pines Rd., Reno, Nev. 89511**

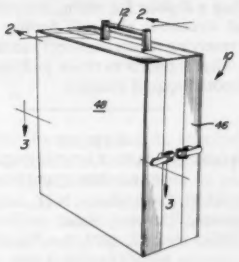
**Filed Dec. 13, 1977, Ser. No. 861,021**

**Int. Cl.**[2] **A47B** *43/00*

**U.S. Cl. 312—324** **6 Claims**

1. A portable storage case particularly useful for containing and displaying for use containers of materials and articles normally referred to as art supplies, the apparatus comprising:

an interior frame portion comprising spaced upper and lower perimetric walls joined at the ends thereof respectively by closed and open side walls, an inner partition member extending between the side walls and at least partially between the upper and lower perimetric walls to divide the interior frame portion with separate storage areas, vertically spaced first shelf members disposed on one side of the inner partition member, the first shelf members extending between and being mounted by the side walls of the interior frame portion, at least one retaining rod being spaced vertically from each first shelf member, rod members extending between and being mounted by the side walls to retain containers on the first shelf members, box-like dividers disposed on the other side of the inner partition member, the dividers being open at the upper ends thereof to receive articles, particularly elongated articles, a second shelf member disposed in surmounting relation to the inner partition member, the second shelf member extending between and being mounted by the side walls of said interior frame portion, and at least one second retaining rod member spaced vertically from each side of the second shelf member, the second retaining rod member extending between and being mounted by the



side walls of the interior frame portion to retain containers on the second shelf member;

said frame portions disposed on either side of the interior frame portion, the side frame portion comprising spaced upper and lower perimetric walls joined at the ends thereof respectively by closed and open side walls, vertically spaced third shelf members extending between and mounted by the side walls for receiving the containers thereon, and at least one retaining rod member spaced vertically from each shelf member, the rod member extending between and being mounted by the side walls to retain the containers on the third shelf members; hinge means disposed on the closed side walls of the interior frame portion and the side frame portions respectively for holding the frame portions in pivotal relation to each other; and,

latch means disposed on the open side walls of the interior frame portion and the side frame portion respectively for releasably holding the frame portions in a closed, volumetrically compact configuration for storage or manual transport of said case.

---

**4,129,347**

## STRUCTURE FOR SUPPORTING AND GUIDING A DRAWER

**Lucien J. Godtschalck, Orsay, France, assignor to Krieg & Zivy Industries, Le Plessis-Robinson, France**

**Filed Jan. 10, 1977, Ser. No. 758,182**

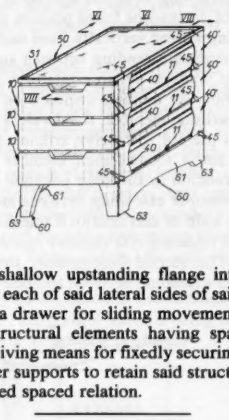
**Claims priority, application France, Jan. 16, 1976, 76 01061**

**Int. Cl.**[2] **A47B** *88/00*

**U.S. Cl. 312—330 R** **11 Claims**

1. A frame structure comprising a plurality of unitary structural elements arranged in spaced superimposed relation for supporting and guiding sliding drawers therebetween, each said structural elements including a rectangular support member having lateral sides, a plurality of runner inserts disposed in

said rectangular support member along said lateral sides thereof and extending through said lateral sides to project both above and below said lateral sides, said runner inserts having upper surfaces arranged coplanar for supporting and facilitating sliding of a respective overlying drawer and lower surfaces arranged coplanar for guiding an upper part of an underlying



drawer, and a shallow upstanding flange integral with and extending along each of said lateral sides of said support member for guiding a drawer for sliding movement, the flanges of each of said structural elements having spaced preformed recesses for receiving means for fixedly securing said structural elements to other supports to retain said structural elements in said superimposed spaced relation.

---

**4,129,348**

## METHOD OF MANUFACTURING TUNGSTEN HALOGEN LAMP

**Robert J. Karlotski, Londonderry, N.H., assignor to GTE Sylvania Incorporated, Danvers, Mass.**

**Filed Nov. 17, 1977, Ser. No. 852,464**
**Int. Cl.[2] H01J *9/395***
**U.S. Cl. 316—20** **3 Claims**

1. In the manufacturing of a tungsten halogen lamp containing a fill including an organic halide, the steps which comprise exhausting the lamp, adding said fill to the lamp, sealing the lamp and then heating the lamp in a nonoxidizing atmosphere to a temperature sufficient to dissociate the organic halide.

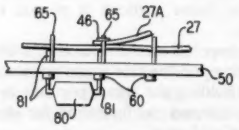
---

**4,129,349**

## QUICK-CONNECT BREADBOARDING SYSTEM

**Charles A. von Roesgen, Westfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Nov. 10, 1975, Ser. No. 630,183**
**Int. Cl.[2] H01R *9/08***
**U.S. Cl. 339—17 C** **5 Claims**



1. Apparatus for mounting electrical circuitry consisting of components having pin terminals, comprising:
a board having first and second sides and a planar array of cylindrical holes therebetween for receiving said pin terminals inserted from said first side;
and a wire and pin terminal receiving element said element characterized by:
an elongate hollow metallic cylindrical body having a gap extending the full wall length, thereby rendering said body expandable;
an outwardly-protruding rim disposed along the exterior surface of said body adjacent to a first end thereof;
a metallic wire connector having a first end comprising a bifurcated slotted wire-receiving beam and a second end comprising a substantially flat edge, said connector second end being integrally attached to the second end of said body;
the spacing between the flat edge of said connector and the protruding rim of said body equaling substantially the thickness of said board
said body being compressably received in one of said holes in said board with said rim and said flat edge gripping said board between them thereby to rigidly but releasably mount said element on said board.

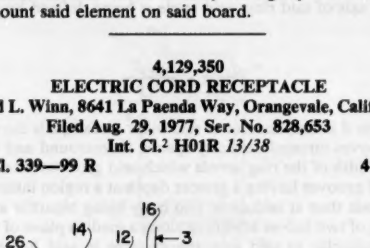
---

**4,129,350**

## ELECTRIC CORD RECEPTACLE

**Donald L. Winn, 8641 La Paenda Way, Orangevale, Calif. 95662**

**Filed Aug. 29, 1977, Ser. No. 828,653**
**Int. Cl.[2] H01R *13/38***
**U.S. Cl. 339—99 R** **4 Claims**



1. An electric cord receptacle for an electric cord having a free end, said electric cord receptacle comprising
a housing;
a cover hingedly affixed to the housing via a pin, said cover having an inner surface in the housing when said cover is closed;
a female plug ferrule mounted in the housing; and
connecting means for connecting the free end of the electric cord to said plug ferrule, said connecting means comprising an electrically conductive contact strip affixed to the inner surface of said cover, said contact strip having one end positioned to electrically contact said plug ferrule and a spaced opposite second end having a cutting contact extending therefrom positioned to electrically contact the electric cord adjacent the free end thereof.

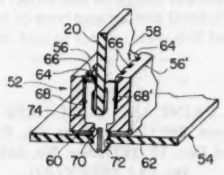
---

**4,129,351**

## CONNECTOR ASSEMBLY FOR PRINTED CIRCUIT BOARD

**Kazuyasu Sugimoto; Hiroshi Yamaya, and Kameki Ishimoto, all of Kadoma, Japan, assignors to Matsushita Electric Industrial Company, Limited, Japan**

**Division of Ser. No. 588,194, Jun. 19, 1975, abandoned. This application Jul. 5, 1977, Ser. No. 813,097**
**Claims priority, application Japan, Jun. 20, 1974, 49-71123; Jun. 20, 1974, 49-71124; Jun. 20, 1974, 49-71155; Jun. 20, 1974, 49-73070; Jun. 20, 1974, 49-73071**
**Int. Cl.[2] H01R *13/50***
**U.S. Cl. 339—176 MP** **13 Claims**



1. A connector assembly for a printed circuit board having a contact-carrying edge portion having a plurality of electrical contacts on at least one face of the contact-carrying edge portion, comprising: an electrically non-conductive housing

structure having a pair of spaced parallel side wall portions forming therebetween an elongated groove which is open at its top, and a bottom wall portion having an inner face at the bottom of said groove; a plurality of electrical contact elements mounted on the inner face of at least one of said side wall portions; a mother board in contact with the outer face of the bottom wall portion of said housing structure; and at least one retaining member consisting of an elastic metal wire element and in elasticity pressing contact in part with the inner face of at least one of said side wall portions of the housing structure and in part with at least one of the opposite faces of said contact-carrying edge portion of the printed circuit board for thereby holding the printed circuit board in a predetermined fixed position having said contacts respectively in contact with said contact elements on the housing structure, said retaining member being electrically isolated from all of said contacts and said contact elements and having at least one end portion projecting outwardly from said bottom wall portion of the housing structure, said end portion being laterally curved and being at least partially in elastically pressing contact with the outer face of said mother board for holding said mother board against the outer face of said bottom wall portion of said housing.

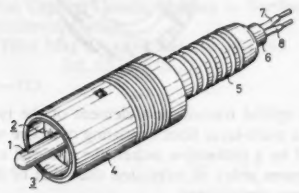
---

**4,129,352**

## PIN PLUG

**Akichika Iizuka, Kanra, Japan, assignor to Iizuka Electric Industry Company Limited, Tomioka, Japan**

**Filed Oct. 3, 1977, Ser. No. 839,073**
**Int. Cl.[2] H01R** *17/06*
**U.S. Cl. 339—177 R** **10 Claims**




1. A pin plug comprising an inner contact member in the form of pin made of conductive material;

an inner insulating member consisting of two semi-cylindrical halves made of insulating material, said two halves forming in a coupled state with their inner surfaces a hollow cylindrical space extending in an axial direction and receiving said pin;

means formed in said pin and the inner surface of said inner insulating member for fixing said pin in position in said cylindrical space in a separable manner;

means formed in said two halves of the inner insulating member for coupling them together in a separable manner;

an outer contact member consisting of two semi-cylindrical halves and surrounding an outer surface of said inner insulating member;

means formed in said inner insulating member and outer contact member for fixing the outer contact member in position on the outer surface of the inner insulating member in a separable manner;

and an outer insulating member consisting of a hollow cylindrical body made of relatively resilient insulating material and enclosing in a separable manner an assembly of the pin, the inner insulating member surrounding the pin and the outer contact member surrounding the inner insulating member so as to hold the assembly in position;

said two fixing means being formed at such positions that the contact surface of the inner insulating member halves and the contact surface of the outer contact member halves intersect with each other at an angle viewed in the axial direction;

whereby said pin is connected to one of two conductors of an electric wire, the other conductor of which is connected to said outer contact member and said electric wire is slidably passed through said outer insulating member.

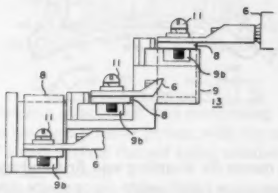
---

**4,129,353**

## TERMINAL BLOCK

**Yasuhide Tabuchi, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Nagoya, Japan**

**Continuation of Ser. No. 728,018, Sep. 29, 1976, abandoned. This application Oct. 17, 1977, Ser. No. 843,023**
**Int. Cl.[2] H01R** *9/10*
**U.S. Cl. 339—242** **4 Claims**




1. A terminal block for connecting the terminals of an electric apparatus to a plurality of load cables, said terminals disposed in a horizontal plane and separated by phase barriers, comprising:

a plurality of auxiliary connectors, each of said connectors having a first end for making connection with said terminals of said electric apparatus, and a second end for making connection to one of said load cables, said first ends of said connectors disposed in a common horizontal plane, said second ends of said connectors disposed in a common vertical plane perpendicular to said horizontal plane and forming transverse steps in said vertical plane; and

an insulation base fixed to the auxiliary connectors to provide insulation therebetween and between said auxiliary connectors and said load cables,

whereby said load cables are connected to said terminals of said electric apparatus in said vertical plane perpendicular to said horizontal plane formed by said terminals

said terminal block having a cable access side from which said load cables are connected to said auxiliary connectors, the second end of said auxiliary connector adjacent said cable access side disposed vertically above all others of said second ends, with all others of said second ends disposed stepwise in said vertical plane with respect to said second end of said auxiliary connector adjacent said cable access sides;

whereby all connections of said load cables to said second ends of said auxiliary cables are unobstructed by said load cables.

---

**4,129,354**

## BUS BAR CLAMP

**Robert F. Polimine, Lynbrook, N.Y., assignor to General Signal Corporation, Rochester, N.Y.**

**Filed Aug. 1, 1977, Ser. No. 820,653**
**Int. Cl.[2] H01R** *7/08, 7/18*
**U.S. Cl. 339—265 F** **6 Claims**

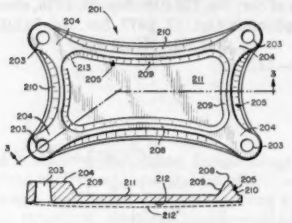
1. A bus bar clamping structure for clamping together a plurality of bus bars, having planar and parallel surfaces, to provide electrical continuity between said bus bars and comprising in combination:

(a) first and second complementary plates each having a generally rectangular configuration, perimetric ribs and fabricated of material subject to deformation in response to stress;

(b) each plate having a web joining said perimetric ribs thereof and extending over the entire area enclosed by said perimetric ribs;

(c) one surface of said web of each plate forming a common surface with one surface of said ribs thereof;

(d) said common surface having a curvature such that if said common surface of one of said plates is placed on a planar horizontal surface, the plate contacts the horizontal surface at a single point with said single point being at the approximate geometric center of said plate;



(e) coupling means for coupling said first and second plates in complementary relationship on opposite sides of a plurality of bus bars, and with said common surfaces facing each other, and

(f) said coupling means including tensioning means for increasing the stress between said common surfaces whereby said common surface are deformed and pressure is applied to said common surfaces starting from said single point and radiating outward towards the limits of said common surfaces.

---

**4,129,355**

## LIGHT BEAM SCANNER WITH PARALLELISM ERROR CORRECTION

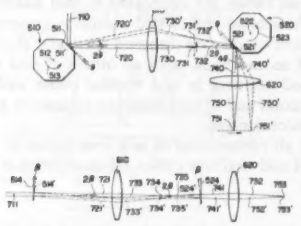
**Masaru Noguchi, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan**

**Filed Jun. 30, 1977, Ser. No. 811,927**

**Claims priority, application Japan, Jul. 2, 1976, 51-79313**

**Int. Cl.[2] G02B *27/17***

**U.S. Cl. 350—6.7** **1 Claim**



1. A light beam scanner, comprising:

(a) a first rotary multi-surfaced mirror for reflecting and deflecting a light beam, said first mirror having a plurality of first reflective surfaces;

(b) a second rotary multi-surfaced mirror for reflecting and deflecting the light beam reflected from said first mirror, said second mirror having a plurality of second reflective surfaces, each of said second reflective surfaces being paired with a corresponding one of said first reflective surfaces;

(c) means for synchronously rotating said first and second mirrors such that said light beam reflected and deflected from a first reflective surface on said first rotary mirror is always reflected and deflected by the corresponding second reflective surface on said second rotary mirror;

(d) the angular deviation between each of said second reflective surfaces and the second rotational axis being the same as the angular deviation between the corresponding first reflective surface and the first rotational axis; and

(e) a relay lens disposed in the optical path between the two mirrors;

(f) the two mirrors being positioned in the conjugate planes of the relay lens to thereby provide a magnification factor of 1, whereby an angular beam deflection error resulting from said angular deviation of a first reflective surface will be corrected by an equal and opposite angular beam deflection error resulting from said angular deviation of the corresponding second reflective surface.

---

**4,129,356**

## OPTICAL TRANSMISSION ELEMENT HAVING PROTECTIVE JACKET TO REDUCE ATTENUATION

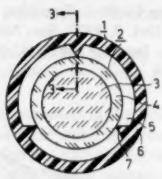
**Ulrich Oestreich, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany**

**Filed Jan. 29, 1976, Ser. No. 653,352**

**Claims priority, application Fed. Rep. of Germany, Jan. 31, 1975, 2504553**

**Int. Cl.[2] G02B *5/14***

**U.S. Cl. 350—96.23** **8 Claims**



1. In an optical transmission element of the type which is built up as a multi-layer fiber consisting of a core with a sheath surrounded by a protective jacket, the material of the sheath having a lower index of refraction than that of the core, the improvement comprising:

(a) the inside diameter of the protective jacket being about twice the diameter of the fiber but in no case less than 50 μm larger than the latter;

(b) the protective jacket comprising a hard plastic material which is not crack prone and has a high modulus of elasticity whereby a smooth inside surface of the protective jacket is possible; and

(c) said protective jacket having a defined, preferably very small, absorption coefficient and a low index of refraction in the range of light wave length used.

---

**4,129,357**

## PARTIAL POLARIZER FILTER

**Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Alan M. Title, Palo Alto, Calif.**

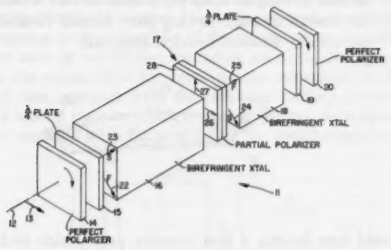
**Filed Aug. 11, 1977, Ser. No. 823,566**

**Int. Cl.[2] G02B *1/02, 5/20***

**U.S. Cl. 350—157** **20 Claims**

1. A birefringent filter module for optical energypropagating along an optical axis comprising an entrance polarizer, said entrance polarizer being polarized in a plane normal to the optical axis, a first birefringent crystal responsive to optical energy exiting the entrance polarizer, said first crystal having a fast axis displaced 45° from a first polarization direction in the plane normal, a partial polarizer responsive to optical energy exiting the first crystal, said partial polarizer having orthogonal high and low transmitivity directions, the high transmitivity direction being in the first direction, a second birefrin-

gent crystal responsive to optical energy exiting the partial polarizer, said second crystal having a fast axis displaced 90° from the fast axis of the first crystal in the normal plane, and an




exit polarizer, said exit polarizer being polarized in the normal plane, the lengths of the first and second crystals differing from each other.

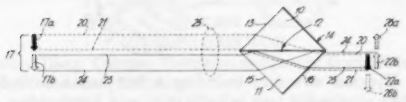
---

**4,129,358**

## OPTICAL SYSTEM FOR IMAGING AN ELONGATE OBJECT IN REARRANGED SECTIONS

**John S. S. Wei, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada**

**Filed May 27, 1977, Ser. No. 801,105**
**Int. Cl.² G02B 27/14**
**U.S. Cl. 350—173** **7 Claims**



1. An optical system for imaging an elongate object in rearranged sections extending side-by-side, comprising:

a pair of prisms, each prism having a base surface and two side surfaces inclined at an acute angle to said base surface, the two prisms in abutting relationship and having a common interface formed by said base surfaces, one of said base surfaces having a 50% reflective coating thereon, the plane of said interface aligned with the centre of the object and extending normal to the longitudinal axis of the object, a light path passing from the object through both prisms, a part through each prism;

an imaging device spaced from and optically aligned with said pair of prisms;

a lens structure positioned between said prisms and said imaging device, to produce an image of said sections on said imaging device; and

means for displacing the part of the light path from said object passing through one of said prisms to said imager, said part displaced in a direction normal to the longitudinal axis of the object, the part of the light path passing through the other prisms undisplaced in said direction;

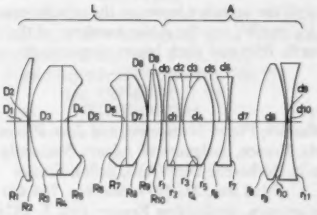
whereby a first image is formed by said displaced part of said light path and a second image is formed by the undisplaced part of the light path, said images displaced longitudinally and laterally relative to each other.

**4,129,359**

## EXTENDING ATTACHMENT LENS

**Kikuo Momiyama, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed May 27, 1977, Ser. No. 801,355**
**Claims priority, application Japan, Jun. 1, 1976, 51-63905**
**Int. Cl.² G02B 9/34, 9/60**
**U.S. Cl. 350—183** **4 Claims**




1. An extending attachment lens comprising:

a first lens having a positive power, with the radius of curvature of a rear surface thereof being smaller than that of a front surface thereof;

a second lens which is a biconcave lens cemented together with the first lens;

a third lens which is a biconvex lens positioned adjacent the second lens;

a fourth lens having a negative power with its front surface concave toward the front and with the radius of curvature of the front surface being smaller than that of a rear surface thereof;

a fifth lens which is a biconvex lens; and

a sixth lens which is a biconcave lens,

the combined power of the first lens, the second lens, the third lens, the fourth lens and the fifth lens being negative, and characterized by the following relationships:

$$1 < \frac{|f_A|}{|f_{1,2,3,4}|} < 1.5 \quad (f_A < 0, f_{1,2,3,4} < 0) \tag{1}$$

$$-0.2 < \frac{e}{|f_A|} < 0.1 \tag{2}$$

$$4.5 < |f_A| \times \left(\frac{1}{f_1} + \frac{1}{f_3} + \frac{1}{f_5}\right) < 7 \tag{3}$$

$$0.18 < \overline{NC} - \overline{NV} \tag{4}$$

$$0.45 < \frac{r_2}{|f_A|} < 0.9 \quad (r_2 < 0) \tag{5}$$

$$0.3 < \frac{r_3 + r_4}{2|f_A|} < 0.5 \tag{6}$$

$$0.7 < \frac{r_5}{r_6} < 1 \quad (r_5 < 0, r_6 < 0) \tag{7}$$

$$0.45 < \frac{r_9}{r_{10}} < 0.8 \quad (r_9 < 0, r_{10} < 0) \tag{8}$$

$$0.01 < \frac{d_5}{|f_A|} < 0.075 \tag{9}$$

$$-0.04 < |f_A| \times \left(\frac{1}{f_1 V_1} + \frac{1}{f_2 V_2} + \frac{1}{f_3 V_3} + \frac{1}{f_4 V_4}\right) < 0.01 \tag{10}$$

$$-0.02 < |f_A| \times \left(\frac{1}{f_5 V_5} + \frac{1}{f_6 V_6}\right) < 0.01 \tag{11}$$

wherein $f_A$ is the focal length of the overall attachment lens system; $f_{1,2,3,4}$ is the combined focal length of the first, the second, the third and the fourth lenses; e is the axial separation between the combined principal point of the first, the second,

the third, and the fourth lenses and the combined principal point of the fifth and the sixth lenses; $f_1$, $f_2$, $f_3$, $f_4$ and $f_5$ are the focal lengths of the first lens, the second lens, the third lens, the fourth lens and the fifth lens respectively; $r_2$, $r_3$, $r_4$, $r_5$, $r_6$, $r_9$ and $r_{10}$ are the radii of curvature of the second surface, the third surface, the fourth surface, the fifth surface, sixth surface, the ninth surface and the tenth surface respectively; $d_5$ is the axial separation between the third and fourth lenses; NV is the average value of the refractive indices of all the positive lenses in the attachment; NC is the average value of the refractive indices of all the negative lenses in the attachment; and $V_1$, $V_2$, $V_3$, $V_4$, $V_5$ and $V_6$ are the Abbe numbers of the first, second, third, fourth, fifth and sixth lenses respectively.

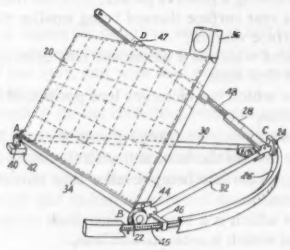
---

**4,129,360**

## HELIOSTATS

**Jean Deflandre; Pierre Matarasso, and Jean-Pierre Traisnel, all of Paris, France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Seine, France**

**Filed Jan. 31, 1977, Ser. No. 764,423**
**Claims priority, application France, Feb. 9, 1976, 76 03447**
**Int. Cl.[2] G02B *5/08***
**U.S. Cl. 350—289** **5 Claims**



1. A heliostat comprising a chassis having a horizontal triangular base and a reflecting panel mounted on the chassis, said triangular base being mounted for pivotal movement about a substantially vertical axis and having wheels for supporting said base in said movement, an oblique support pivotably attached at one apex of said triangular base so that it can pivot about a horizontal axis parallel to a side of the triangular base which is opposite to said apex, slidable securing means slidable along said oblique support for fixing said panel to said support at a variable distance along said support, means for pivotably attaching one side of said panel to said side of said triangular base so that it can pivot about said triangular base side, means for controlling the rotation of said triangular base, and means for controlling the movement of said slidable securing means whereby said panel can be oriented in altitude as well as in azimuth.

---

**4,129,361**

## EYE TESTING DEVICE FOR PRESCRIBING EYEGLASSES

**Peter A. Bacotti, 53 Eighth Ave., Brooklyn, N.Y. 11217, and Frederick M. Kraft, 25 Central Park West, New York, N.Y. 10023**

**Filed Mar. 10, 1977, Ser. No. 776,182**
**Int. Cl.[2] A61B *3/04, 3/02;* G02C *7/02, 5/00***
**U.S. Cl. 351—22** **3 Claims**

1. Device for prescribing refraction lenses for eyeglasses to be used by highly hyperopic patients comprising

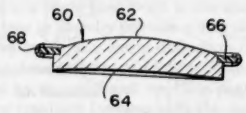
a frame means:

a testing lens mounted within said frame means:

said lens having a first surface with a predetermined concave spherical curvature;

said lens having a second surface spaced from said first surface and formed with an aspherical convex curvature, the curvature of said convex surface being greater than the curvature of said concave surface;

said frame means comprising an outer circular frame having an inner circular surface and an inner circular washer having an outer circular surface that abuts said inner circular frame surface and formed to be held therein, said washer having an inner peripheral surface which includes an innermost edge having part thereof formed with an outwardly directed beveled area; and




said lens having a first circular part which includes said concave spherical surface, said first circular part having a diameter greater than the diameter of said innermost edge of said washer, and said lens having a second circular part which includes said convex aspherical surface, said second circular part having a diameter formed to correspond with and snugly fit against said innermost edge.

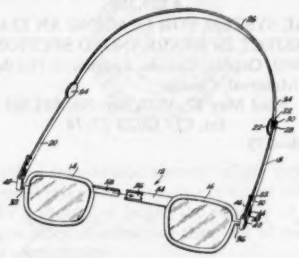
---

**4,129,362**

## EYEGLASSES

**Francisco Lorenzo, 1164 SW. First St., Miami, Fla. 33130**

**Filed Dec. 29, 1976, Ser. No. 755,143**
**Int. Cl.[2] G02C *5/14***
**U.S. Cl. 351—123** **5 Claims**



1. Eyeglass structure including a first and a second lens holding ring and a lens in each ring, said lens holding rings each including a portion extending toward the other lens holding ring and comprising mutually intercooperating means for interconnection in male and female relationship above the nose level of a wearer, and a pair of temple pieces, each temple piece being pivotally connected to the lens holding rings and each terminating at a distal end zone and a band segment of spring material having a first end connected to the distal end zone of one of the temple pieces and a second end connected to the distal end zone of the other of the temple pieces at a pivotal connection, said band segment being sized to fit snugly about the head of a wearer to distribute the entire weight of the eyeglass structure to the head and not to the ears and nose, and cushions connected at the juncture of the band segment and temple pieces and confronting one another for distributing tension loads by the band segment.

---

**4,129,363**

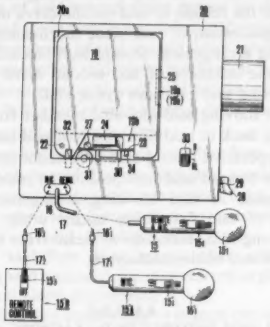
## SOUND MOTION PICTURE CAMERA

**Yoshio Komine, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Apr. 22, 1977, Ser. No. 790,497**
**Claims priority, application Japan, Apr. 26, 1976, 51-47514**
**Int. Cl.[2] G03B *31/02***
**U.S. Cl. 352—29** **28 Claims**

1. A motion picture camera capable of simultaneous sound recording on a sound film in a sound film cartridge containing a sound film, comprising:

(A) a cartridge loading chamber for loading a sound film cartridge;
(B) a manually operable camera release means,
(C) a sound recording means for recording sound signals on the sound film, said recording means being operatively associated with the camera release means and changeable in response to the operation of the release means between a first state in which the recording means is disengaged from the sound film for enabling the retracting of the sound film cartridge from the cartridge loading chamber and a second state in which the recording means is operatively engaged with the sound film for sound recording,

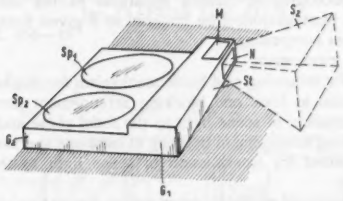


(C') a manually operable locking means couplable to said release means for locking said camera release means at a position at which said sound recording means is set into said second state, and
(D) a preventive means for preventing the retracting of the sound film cartridge from the cartridge loading chamber when the sound recording means is set in the second state, said preventive means being arranged in operative association with the camera release means so as to enable the retracting of the film cartridge when the operation of the release means is released and the sound recording means moves into the first state.

## 4,129,364
## FILM PROJECTOR

Bernhard Dietz, Cologne, Germany, assignor to Bruno Albrecht KG, Duesseldorf, Germany

Filed Apr. 21, 1977, Ser. No. 789,664
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1976, 2617799
Int. Cl.[2] G03B 21/28
U.S. Cl. 353—99 5 Claims

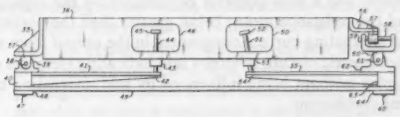


1. Arrangement for projecting film pictures comprising the following: a light source, a window, means for moving a film containing pictures through the window, a system of lenses on the side of the window opposite the light source, a first mirror in the light beam projected by the lens system, said first mirror forming an angle with the axis of the light beam, means for rotating the first mirror about the axis of the light beam, a second mirror which at a first rotated position of the first mirror is located in the light beam deflected by the first mirror and whose plane makes an angle of substantially 45° with the plane of the first mirror located in the first rotated position, a third mirror located in the light beam projected by the first mirror when the first mirror is turned in a second rotated position, the plane of the third mirror forming an angle of substantially 45° with the plane of the first mirror.

## 4,129,365
## WIDE ANGLE ANAMORPHIC DISPLAY PROJECTION SYSTEM

Frank J. Aversano, Hicksville; Leon Carver, Woodbury, and Ludwik I. Seifert, Port Washington, all of N.Y., assignors to Sperry Rand Corporation, New York, N.Y.

Filed May 13, 1977, Ser. No. 796,778
Int. Cl.[2] G03B 21/28
U.S. Cl. 353—99 10 Claims

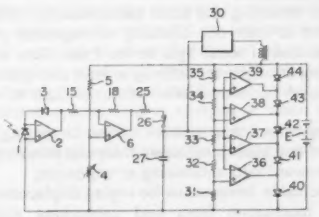


1. Optical image projector means including at least one mirror, said mirror comprising:
flexible reflector means,
frame means having first and second opposed edge means, means at said first and second edge means for applying bending moments to said flexible reflector means, thereby causing said flexible reflector means selectively to assume a shape in the form of a sector of a circular cylinder,
said means for applying bending moments including: first pivot means for adjustably coupling said flexible reflector means to said frame means adjacent said first edge means, and
second pivot means spaced from said first pivot means for adjustably coupling said reflector means to said frame means adjacent said second edge means,
said means for applying bending moments cooperating with said first and second pivot means for applying said bending moments to said flexible reflector means.

## 4,129,366
## PHOTOMETRIC DEVICE FOR A CAMERA

Sakuji Watanabe, Yono, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Apr. 1, 1976, Ser. No. 672,770
Claims priority, application Japan, Apr. 30, 1975, 50-57767[U]
Int. Cl.[2] G03B 7/08
U.S. Cl. 354—24 2 Claims



2. In a photometric device for cameras which comprises:
a photometric circuit including an operational amplifier, a photo-diode connected between two input terminals of the operational amplifier to receive light coming from an object to be photographed and passed through an objective of the camera, and a logarithmic conversion element connected between one of the input terminals of the operational amplifier and an output terminal thereof to pro-

duce an output proportional to the logarithm of the output current from the photo-diode;

a plurality of indicating elements for indicating exposure conditions measured by the photometric circuit;

a control circuit for controlling the indicating elements in accordance with the output from the photometric circuit;

means for interrupting said light passed through the objective from impinging on the photo-diode in response to the shutter release operation;

a memory capacitor for memorizing the output of the photometric circuit produced prior to said interruption;

the improvement comprising resistance means connected to said capacitor, the resistance means and the capacitor cooperating to attenuate the amplitude of the alternating current component included in the output from the photometric circuit and having a frequency an integral number of times as high as the frequency of a commercial power source, and a time constant determined by the capacitor and the resistance means being greater than the period of the alternating current component in the output from said photometric circuit, whereby said indicating elements can display without being influenced by said alternating current component.

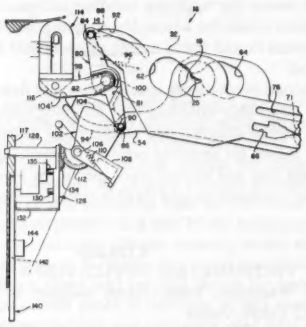
---

**4,129,367**

## EXPOSURE CONTROL SYSTEM

**George D. Whiteside, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.**

**Filed Sep. 2, 1977, Ser. No. 830,019**
**Int. Cl.[2] G03B *17/50, 9/08, 9/40***
**U.S. Cl. 354—83** **27 Claims**



1. A photographic camera apparatus having means for mounting photographic film material at a given focal plane, said camera comprising:

a blade mechanism;

means for mounting said blade mechanism for displacement between at least one blocking arrangement precluding transmission of scene light to the focal plane and an unblocking arrangement defining at least one aperture value structured for transmission of scene light to the focal plane;

first selectively actuable drive means for urging displacement of said blade mechanism from said blocking arrangement toward said unblocking arrangement;

second actuable drive means for urging displacement of said blade mechanism from said unblocking arrangement toward said blocking arrangement;

first latch means for restraining said blade mechanism and said second drive means, said first latch means including a movable member disposed for displacement between first and second positions and structured and configured for restraining said blade mechanism in said blocking arrangement against the urging of said first drive means while simultaneously restraining said second drive means from urging displacement of said blade mechanism while said first latch means movable member is in said first position, said first latch means being selectively actuable to move said movable member from its said first position to its said second position to effect the release of said blade mechanism and said second drive means, said blade mechanism thereafter moving under the influence of said first drive means from said blocking position toward said unblocking position to commence an exposure cycle;

second latch means for restraining said second drive means from urging displacement of said blade mechanism upon the release of said second drive means by said movable member said second latch means being thereafter actuable to cause the release of said second drive means and effect the displacement of said blade mechanism from said unblocking arrangement toward said blocking arrangement under the influence of said second drive means thereby completing said exposure cycle; and

means for moving said movable member from said second position back to said first position, said movable member being operative during said movement from said second position toward said first position to maintain said blade mechanism in said blocking arrangement against the urging of said first drive means while simultaneously restraining said second drive means from urging displacement of said blade mechanism.

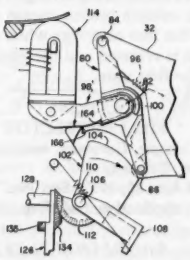
---

**4,129,368**

## LAST FLASH INHIBIT FOR MAGNET ACTUATED SCANNING SHUTTER BLADE ARRANGEMENT

**George D. Whiteside, Lexington, and Bruce K. Johnson, Andover, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.**

**Filed Sep. 2, 1977, Ser. No. 830,024**
**Int. Cl.[2] G03B *15/04***
**U.S. Cl. 354—128** **5 Claims**



1. A photographic camera apparatus having means for mounting photographic film material at a given focal plane, said camera comprising:

a blade mechanism;

means for mounting said blade mechanism for displacement between at least one blocking arrangement precluding transmission of scene light to the focal plane and an unblocking arrangement defining at least one aperture value structured for transmission of scene light to the focal plane;

first selectively actuable drive means for urging displacement of said blade mechanism from said blocking arrangement toward said unblocking arrangement;

second actuable drive means for urging displacement of said blade mechanism from said unblocking arrangement toward said blocking arrangement;

first latch means for restraining said blade mechanism and said second drive means, said first latch means including a movable member disposed for displacement between first and second positions and structured and configured for restraining said blade mechanism in said blocking arrangement against the urging of said first drive means while

simultaneously restraining said second drive means from urging displacement of said blade mechanism while said first latch means movable member is in said first position, said first latch means being selectively actuable to move said movable member from its said first position to its said second position to effect the release of said blade mechanism and said second drive means, said blade mechanism thereafter moving under the influence of said first drive means from said blocking position toward said unblocking position to commence an exposure cycle;

second latch means for restraining said second drive means from urging displacement of said blade mechanism upon the release of said second drive means by said movable member said second latch means being thereafter actuable to cause the release of said second drive means and effect the displacement of said blade mechanism from said unblocking arrangement toward said blocking arrangement under the influence of said second drive means thereby completing said exposure cycle;

means for moving said movable member from said second position back to said first position, said movable member being operative during said movement from said second position toward said first position to maintain said blade mechanism in said blocking arrangement against the urging of said first drive means while simultaneously restraining said second drive means from urging displacement of said blade mechanism;

means for releasably connecting to at least one conventional flash lamp together with means for providing a first signal to fire the connected flash lamp at the appropriate time during said exposure cycle; and

means for sensing the operative condition of at least one connected flash lamp at said connecting means and providing a second signal indicative of an inoperative or missing flash lamp, said second signal being effective to actuate said second latch means to release said second drive means, said photographic apparatus additionally including means for ultimately restraining movement of said first latch means movable member from its said first position to its said second position upon the release of said second drive means, while accommodating movement of said first latch means movable from its said second position back to its said first position.

---

**4,129,369**

## PARALLAX COMPENSATING DEVICE FOR THE VIEW FINDER IN A CAMERA

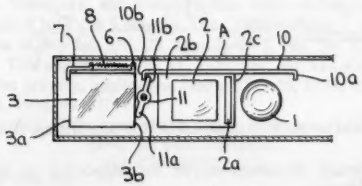
**Haruo Kobayashi, and Toshinori Imura, both of Sakai, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan**

**Filed Apr. 1, 1977, Ser. No. 783,948**

**Claims priority, application Japan, Apr. 8, 1976, 51-44168[U]**

**Int. Cl.[2] G03B** *3/00, 13/14*

**U.S. Cl. 354—197** **6 Claims**




1. A camera which comprises sides which together form a small size body having a flat rectangular paralleopiped form and a photographic optical system having a photographic optical axis oriented perpendicular to a plane delineated by a side of said camera with the longest and shortest dimensions of the paralleopiped form, said camera also comprising:

a view finder optical system having a view finder optical axis oriented in parallel with said photographic optical axis;

close-up lens means for changing the focal length of said photographic optical system to that for close-up photography, said close-up lens means being movable between an operating position in alignment with said photographic optical axis and a retracted position in a space between the optical axis of said photographic optical axis and said view finder optical axis where said close-up lens means is out of alignment with said photographic optical axis;

concave objective lens means provided in said view finder optical system, said concave objective lens means being movable in a direction parallel to the locus of the movement of said close-up lens so as to be selectively positionable between an ordinary photographic position and a compensating position for compensating for finder parallax, upon close-up photography; and

an operating means which is interactable with said concave objective lens means and which is movable in accordance with the positioning of said close-up lens means to move said concave objective lens means from said ordinary photographic position to said compensating position when said close-up lens is positioned in the photographic optical axis.

---

**4,129,370**

## CONTROLLING CIRCUIT FOR ELECTRIC SHUTTERS

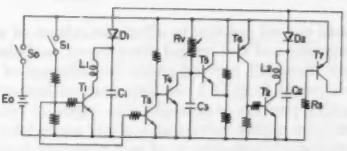
**Yasuo Ishiguro, and Kenji Wakazono, both of Tokyo, Japan, assignors to Copal Company Limited, Tokyo, Japan**

**Filed Sep. 30, 1977, Ser. No. 838,224**

**Claims priority, application Japan, Oct. 8, 1976, 51-134866[U]**; Oct. 8, 1976, 51-134867[U]

**Int. Cl.[2] G03B** *9/62*

**U.S. Cl. 354—234** **5 Claims**




1. A controlling circuit for electric shutters comprising a first capacitor, a first driving coil connected to said first capacitor, a first switching means connected between said first capacitor and first driving coil and capable of flowing a discharge current to said first driving coil from said first capacitor when made to conduct to open a shutter, an exposure time controlling circuit connected to said first switching means, a second switching means connected to an output terminal of said exposure time controlling circuit and made to conduct by an electric current issued from said exposure time controlling circuit, a second driving coil connected to said second switching means and working to close the shutter when energized, a second capacitor connected between said second switching means and second driving coil and flowing a discharge current to said second driving coil to energize it when said second switching means is made to conduct, and a constant current circuit connected to said first and second capacitors to charge them.

---

**4,129,371**

## ELECTROMAGNET CONTROLLED SCANNING SHUTTER BLADE ARRANGEMENT

**Donato F. Pizzuti, Saugus, Mass., assignor to Polaroid Corporation, Cambridge, Mass.**

**Filed Sep. 2, 1977, Ser. No. 830,111**

**Int. Cl.[2] G03B** *9/08, 9/40*

**U.S. Cl. 354—234** **15 Claims**

1. A photographic camera apparatus having means for

mounting photographic film material at a given focal plane, said camera comprising:

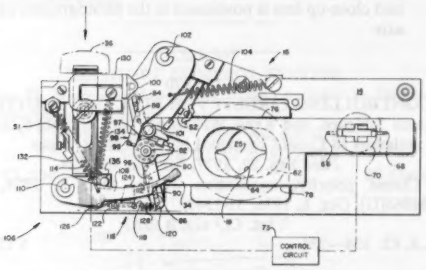
a blade mechanism;

means for mounting said blade mechanism for displacement between at least one blocking arrangement precluding transmission of scene light to the focal plane and an unblocking arrangement defining at least one aperture value structured for transmission of scene light to the focal plane;

first selectively actuable drive means for urging displacement of said blade mechanism from said blocking arrangement toward said unblocking arrangement;

second selectively actuable drive means for urging displacement of said blade mechanism from said unblocking arrangement toward said blocking arrangement;

first latch means movable between first and second positions for restraining said blade mechanism in said blocking arrangement against the urging of said first drive means and restraining said second drive means from urging displacement of said blade mechanism while said first latch means is in said first position, said first latch means being selectively actuable to move from its said first position to




its said second position to effect the release of said blade mechanism and said second drive means, said blade mechanism thereafter moving under the influence of said first drive means from said blocking position toward said unblocking position to commence an exposure cycle;

second latch means for restraining said second drive means from urging displacement of said blade mechanism upon the release of said second drive means by said first latch means, said second latch means being thereafter actuable to cause the release of said second drive means and effect the displacement of said blade mechanism from said unblocking arrangement toward said blocking arrangement under the influence of said second drive means and thereby completing said exposure cycle; and

means for moving said first latch means from said second position back to said first position, said first latch means being operative during said movement from said second position toward said first position to maintain said blade mechanism in said blocking arrangement against the urging of said first drive means while simultaneously restraining said second drive means from urging displacement of said blade mechanism.

---

**4,129,372**

## LIGHT MIXING APPARATUS AND PHOTOGRAPHIC ENLARGER EMBODYING SAME

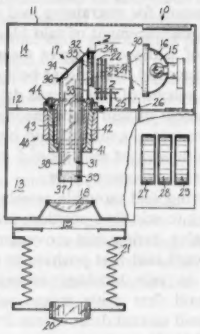
**Michael Allgeier, Torrance, Calif., assignor to Vivitar Corporation, Santa Monica, Calif.**

**Continuation-in-part of Ser. No. 715,154, Aug. 17, 1976, abandoned. This application Mar. 2, 1977, Ser. No. 773,492**

**Int. Cl.**[2] **G03B** *27/00, 27/76;* **G02B** *5/14*

**U.S. Cl. 355—1** **36 Claims**

**26**. A photographic enlarger comprising a housing member, a wall member dividing said housing member into upper and lower portions, a light mixing device in the form of a solid rod-like member of optically clear material having a straight longitudinal axis and smooth peripheral walls, said rod-like member having first and second end surfaces, means supporting said rod-like member through said wall member with said first end surface in said upper portion and said second end surface in said lower portion, a light source in said upper portion, said source directing light into the first end of said rod-like member, first means for diffusing the light entering said first end, whereby the diffused light is internally reflected by said smooth peripheral wall as it travels generally axially of said rod-like member with resulting mixing, said rod-like mem-



ber having an essentially constant diameter throughout its length and a length to diameter ratio of at least three and one-half to one to provide sufficient mixing by the internal reflections from said peripheral wall, said support means having minimal contact with said rod-like member to minimize generation of heat at the contact, a condenser lens disposed below said second end of said rod-like member to receive the light output therefrom and second means for diffusing light exiting said rod-like member and entering said condenser lens.

---

**4,129,373**

## ELECTROPHOTOGRAPHIC APPARATUS

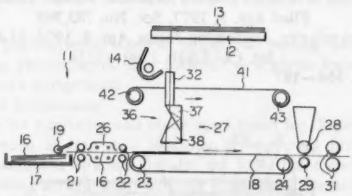
**Yukio Ogura, and Mitsuhisa Fukuda, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan**

**Filed Sep. 8, 1977, Ser. No. 831,624**

**Claims priority, application Japan, Sep. 9, 1976, 51-120508**[U]; Nov. 1, 1976, 51-130544

**Int. Cl.**[2] **G03B** *27/00;* **G03G** *15/28, 15/32*

**U.S. Cl. 355—1** **9 Claims**



**5**. An electrophotographic apparatus comprising, in combination:

a stationary document carrier for supporting an original document;

a photosensitive member;

a focussing optical fiber array for focussing a light image of a linear portion of the original document onto the photosensitive member;

drive means for producing relative scanning movement between the document carrier, optical fiber array and photosensitive member in such a manner that the optical

fiber array and the photosensitive member are moved relative to the document carrier; and

reflector means comprising two triangular prisms disposed between the optical fiber array and the photosensitive member for reflecting the light image an odd number of times which is at least three times, the reflector means reflecting the light image onto the photosensitive member substantially parallel to the optical axis of the optical fiber array.

---

**4,129,374**

## ELECTROPHOTOGRAPHIC COPYING MACHINE HAVING MOVING CARRIER FOR ORIGINAL

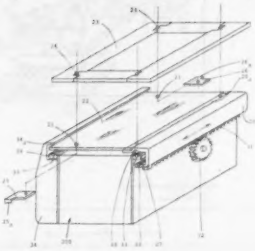
**Katsuzo Uchida, Yamatokoriyama; Hiroaki Uchiyama, Nara, and Akira Mitsuyama, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Nov. 17, 1976, Ser. No. 742,448**

**Claims priority, application Japan, Nov. 18, 1975, 50-157126[U]**

**Int. Cl.² G03G *15/28***

**U.S. Cl. 355—8** **9 Claims**



1. An electrophotographic copying machine having a reciprocating original carrier, said original carrier comprising:

a. a transparent platen;

b. a frame member fixed to only one side edge of the transparent platen;

c. a pair of guide rails secured to both side walls of the copying machine body;

d. first supporting means for slidably supporting said frame member on one of said guide rails;

e. second supporting means for slidably supporting the transparent platen on the other guide rail at the opposite side edge to the side where the frame is fixed; and

f. means for driving the original carrier to reciprocate said carrier through said frame member.

---

**4,129,375**

## METHOD AND APPARATUS FOR ELECTRICALLY BIASING DEVELOPING ELECTRODE OF ELECTROPHOTOGRAPHY DEVICE

**Seiichi Miyakawa, and Tadahiro Eda, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan**

**Division of Ser. No. 575,328, May 7, 1975, Pat. No. 4,050,806. This application Jul. 11, 1977, Ser. No. 814,806**

**Claims priority, application Japan, May 10, 1974, 49/52010; Jun. 14, 1974, 49/67714**

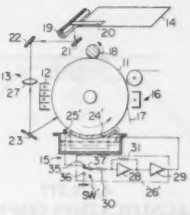
**The portion of the term of this patent subsequent to Sep. 27, 1994, has been disclaimed.**

**Int. Cl.² G03G *15/10***

**U.S. Cl. 355—10** **15 Claims**

1. In an electrophotographic device having a photoconductive member, charging means for charging the photoconductive member, imaging means for radiating a light image of an original document onto the photoconductive member, a developing electrode disposed adjacent to the photoconductive member after the photoconductive member has been charged by the charging means and radiated with the light image by the imaging means, and developing means utilizing a developing solution for developing the electrostatic image, the apparatus comprising:

sensing means disposed at least partially in said developing solution and arranged at a position corresponding to image areas of the photoconductive member for automatically sensing through the developing solution the potential remaining on the photoconductive member by means of electrostatic induction and the electrical conductivity of the developing solution; and



computing means to automatically compute the biasing voltage to be applied to the developing electrode in accordance with the value of the sensed potential and applying said biasing voltage to the developing electrode.

---

**4,129,376**

## ELECTROPHOTOGRAPHIC APPARATUS

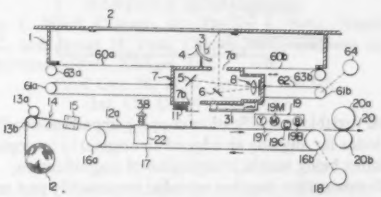
**Teruo Yotsukura, Hitachi, Japan, assignor to Hitachi, Ltd., Japan**

**Filed Jun. 14, 1976, Ser. No. 695,759**

**Claims priority, application Japan, Jun. 16, 1975, 50-71878**

**Int. Cl.² G03G *15/00, 15/28***

**U.S. Cl. 355—11** **3 Claims**



1. An electrophotographic apparatus comprising an original station, a photoconductive recording medium, a charger for uniformly charging the surface of said photoconductive recording medium, means for supporting said uniformly-charged photoconductive recording medium, and an optical system for optically exposing the recording surface of said recording medium to the information image of the original located on said original station, developer means for developing the electrostatic latent image on said recording surface of said recording medium exposed by said optical system, and fixer means for fixing on the recording surface a toner attached to said recording surface in accordance with said latent image, said optical system including a light source and an optical box reciprocally movable along the inside of said original station, said optical box including reflector means for introducing the light reflected on the original to the recording surface of said recording medium, said reflector means including a mirror lens, a prism lens, a lens holder for supporting said mirror lens and said prism lens, a guide rail for slidably supporting said lens holder, and switching means for sliding said lens holder along said guide rail, said developer means including a plurality of developing units each having a toner containing a sublimable dye, said fixer means including a pressure roller for fixing toner on the recording surface, wherein said switching means in said optical system includes a switching lever mounted swingingly on said optical box, said switching lever having an end engag-

ing said lens holder, and an engaging roller adapted to project into the operating locus of said switching lever, said operating locus being traced in response to the movement of said optical box.

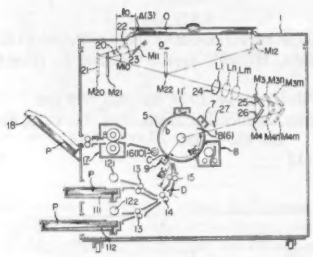
---

**4,129,377**

## VARIABLE MAGNIFICATION COPYING APPARATUS

**Koichi Miyamoto; Yoshikuni Tohyama, both of Tokyo; Seiji Sagara, Kawasaki; Yoshimasa Kimura, Kawasaki, and Masato Ishida, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Dec. 14, 1976, Ser. No. 750,569**
**Claims priority, application Japan, Dec. 18, 1975, 50-151411**
**Int. Cl.[2] G03G *15/00***
**U.S. Cl. 355—14** **16 Claims**



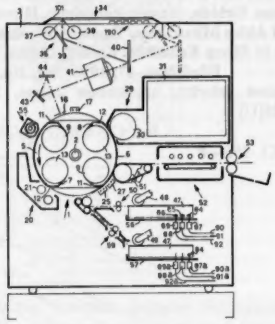
1. A variable magnification copying apparatus comprising:
an index for aligning an edge of an original to be copied, said index being usable irrespective of magnification;
a photosensitive member movable sequentially past an image exposure station, then an image developing station and then an image transfer station at a constant peripheral speed irrespective of magnification;
scanning means movable along a predetermined path to optically scan the original, wherein the scanning velocity of said scanning means varies in inverse proportion to a selected copy magnification;
image forming means for projecting onto said photosensitive member at said image exposure station a light image of the original scanned by said scanning means at a speed corresponding to the selected magnification to form an electrostatic latent image thereon of the selected magnification;
developing means for developing the electrostatic latent image into a developed image at said developing station;
means for conveying copy material to said transfer station;
transfer means for transferring the developed image onto a copy material at said transfer station;
detecting means for detecting the position of said scanning means and for producing a signal when said scanning means reaches a position where it substantially scans the edge of the original; and
means coupled to said detecting means for controlling said conveying means in response to said signal to ensure that the leading edge of the developed image on said photosensitive medium registers with the leading edge of the copy material irrespective of the selected copying magnification.

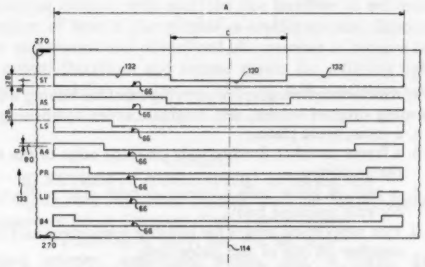
**4,129,378**

## ELECTROPHOTOGRAPHIC COPYING MACHINE HAVING A MASKING DEVICE FOR DIFFERENT COPY SHEET FORMATS

**Luciano Rattin, Ivrea (Turin), and Roberto Guelfo, Montanaro (Turin), both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy**

**Filed Jan. 7, 1977, Ser. No. 757,537**
**Claims priority, application Italy, Jan. 20, 1976, 67123 A/76**
**Int. Cl.[2] G03G *15/00***
**U.S. Cl. 355—14** **5 Claims**





1. In an electrophotographic copying machine having a moving photoconductive surface adapted to be charged and to carry an electrostatic latent image thereon,
developing means positioned at a developing zone to develop the moving electrostatic image on the surface, the developed image being adapted for transfer to a copy sheet having a format selected from among at least two different copy sheet formats usable in the machine, and selecting means for selecting the copy sheet format to be used,
a discharge device positioned immediately before the developing zone, and adapted, when activated, to discharge a side edge portion of the photoconductive surface during a first mode of operation, and during a second mode of operation to discharge a trailed edge portion of the photoconductive surface, the dimensions of said edge portion being dependent upon the copy sheet format selected,
means for detecting the position of the photoconductive surface during its motion,
and control means responsive to the selecting means and to the detecting means for activating the discharge device in the first mode of operation during a first part of said motion, depending on the selected format, and for switching the discharge device to the second mode of operation during the remaining part of the motion.

4,129,379

## OPTICAL SYSTEM FOR ELECTROSTATIC COPIERS

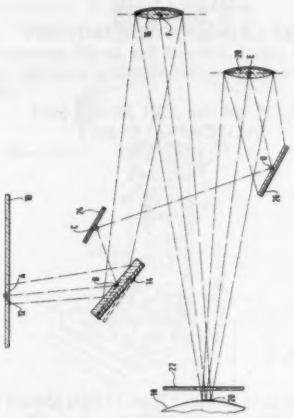
Harriet H. Ogrisek, Bonndorferstr. 7, 7827 Loffingen, Fed. Rep. of Germany, and Kurt Egger, Bahnhofstr. 13-15, 7470 Albstadt-Tailfingen, Fed. Rep. of Germany

Filed Nov. 16, 1977, Ser. No. 851,967

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1976, 7636234[U]

Int. Cl.[2] G03B *27/34, 27/40, 27/70*

U.S. Cl. 355—57 11 Claims



1. An optical system for an electrostatic copying machine, said copying machine including means for receiving an original document to be copied; means for providing moving illumination of sequential line portions of said original document; a primary mirror for reflecting light from said illuminated line portions of said original document to a first objective element, said first objective element being disposed to form a focussed first image of said illuminated line portions on a copying drum; and means for rotating said copying drum in synchronism with said moving illumination; and wherein the improvement comprises:

means for selectively pivoting said primary mirror into a first and a second position;

first and second supplemental mirrors, disposed externally to the light path from said primary mirror to said first objective element and located, respectively, on opposite sides of said light path, the planes of said supplemental mirrors being parallel and inclined with respect to a plane normal to said light path and said supplemental mirrors being set at an oblique angle with respect to said light path; and

a second objective element, located displaced from the optical axis of said first objective element, for receiving light from said second supplemental mirror and form forming a focussed second image thereof on said copying drum; whereby, when said primary mirror is placed in its said second position, light from said illuminated line portions is reflected by said primary mirror onto said first supplemental mirror, thence onto said second supplemental mirror and thence to said second objective element which forms said second image thereof on said copying drum, the beam of said second objective element being substantially parallel to the beam of said first objective element, the size of said second image being different from the size of said first image and at least one respective edge of said first and second images being in the same relative location on said copying drum.

4,129,380

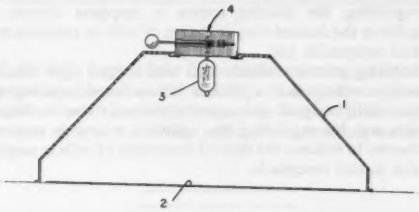
## COPY APPARATUS USING CHEMICAL FLASHLAMP

Timothy Fohl, Carlisle, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed May 13, 1977, Ser. No. 796,795

Int. Cl.[2] G03B *27/30, 27/04*

U.S. Cl. 355—113 6 Claims



1. In a low cost portable copier of the type having a housing and a bottom surface at which a photosensitized sheet and an original can be disposed, and a pulse type flashlamp disposed within the housing so that radiant energy therefrom can be directed toward the photosensitized sheet and original, the improvement which comprises said flashlamp being a chemical flashlamp containing a combustible material and a combustion supporting means, and the copier having ignition means for flashing the flashlamp, said ignition means comprising a mechanically actuated lamp-striker spring which can be deflected and then released to ignite the flashlamp.

4,129,381

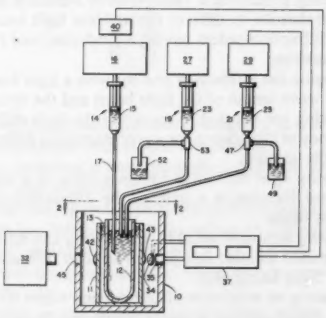
## APPARATUS AND METHOD FOR PREPARING A PARTICLE SUSPENSION

George L. Wied, Chicago, Ill.; Gunter F. Bahr, Washington, D.C., and James H. Puls, Chicago, Ill., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Oct. 28, 1976, Ser. No. 736,516

Int. Cl.[2] G01N *1/00, 21/00*

U.S. Cl. 356—36 9 Claims



1. Apparatus for measuring and adjusting the concentration of a fluid suspension of cells while said suspension is subjected to particle-dispersing physical agitation, which comprises:

a light transmitting receptacle for retaining a suspension of cells;

agitation means for subjecting a suspension of cells in said receptacle to physical agitation to break up cell clumps without destroying the cells;

diluting means for diluting a suspension of cells in said receptacle to achieve a desired particle concentration;

a light source for passing a light beam through said receptacle;

first light sensing means positioned to receive direct light

from said source passed through said receptacle and obtain a first light signal;

second light sensing means positioned to receive scattered light from said source passed through said receptacle and obtain a second light signal;

monitoring means connected to said first light sensing means and to said diluting means for comparing the first light signal with a predetermined value for dilution and for regulating the diluting means in response thereto to achieve the desired concentration of cells in suspension in said receptacle; and

monitoring means connected to said second light sensing means and to said agitation means for comparing the second light signal with a predetermined value for dispersion and for regulating the agitation means in response thereto to achieve the desired dispersion of cells in suspension in said receptacle.

---

**4,129,382**

## METHOD AND APPARATUS FOR STORING AND READING AUTHENTICATING INFORMATION

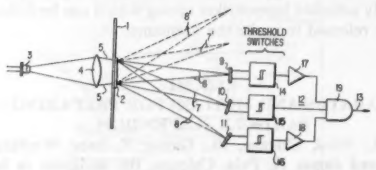
**David L. Greenaway, Birchwil, Great Britain, assignor to Landis & Gyr, Zug, Switzerland**

**Filed Aug. 9, 1976, Ser. No. 712,751**

**Claims priority, application Switzerland, Aug. 14, 1975, 010602/75**

**Int. Cl.[2] G02B *27/38***

**U.S. Cl. 356—71** **8 Claims**




1. A method of providing and reading an authenticating indicia on a carrier comprising the steps of:

disposing a diffraction grating on the carrier said diffraction grating producing a phase shift in a portion of light incident thereon to diffract the incident light into a plurality of diffraction orders having a predetermined ratio of light intensities;

impinging the diffraction grating with a light beam wherein the wave length of the light beam and the structure of the grating are selected to maximize the light diffraction efficiency of the grating for a predetermined diffraction order of the grating;

receiving light diffracted by the grating at a first predetermined location in a path of the diffraction order of the light beam;

receiving light diffracted by the grating at a different predetermined location in a path of another diffraction order of the light beam; and,

producing an indication of authenticity when the energies of the light received at the locations are in a predetermined proportion to one another.

---

**4,129,383**

## SMOKE DETECTOR AND HOUSING ASSEMBLY THEREFORE

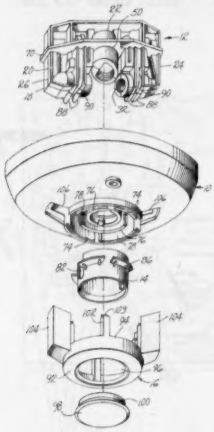
**William J. Malinowski, Pembroke, Mass., assignor to Chloride Incorporated, Tampa, Fla.**

**Filed Feb. 10, 1976, Ser. No. 656,833**

**Int. Cl.[2] G01N *21/00***

**U.S. Cl. 356—439** **4 Claims**

1. A smoke detector housing, comprising a support plate having a central aperture and a pair of apertures laterally spaced from the central aperture, an optical component retainer assembled with the base plate, said retainer having a base portion disposed on the rear side of the base plate, a medial portion projecting through the central aperture of the base plate, said medial portion having an internal cavity opening forwardly and shaped to receive a photo-cell, said retainer having a pair of forwardly projecting portions extending through the pair of laterally spaced apertures, one of said forwardly projecting portions having an internal cavity opening toward the other forwardly projecting portions to receive



a light source so as to project a beam of light toward the other forwardly projecting portion, said other forwardly projecting portion having an aperture with an opening positioned in the path of said light beam, said medial portion having an internal cavity opening forwardly and shaped to receive a photo-cell in position to view the light beam, said support plate and said retainer having cooperating means positioning said retainer in relation to said support plate.

---

**4,129,384**

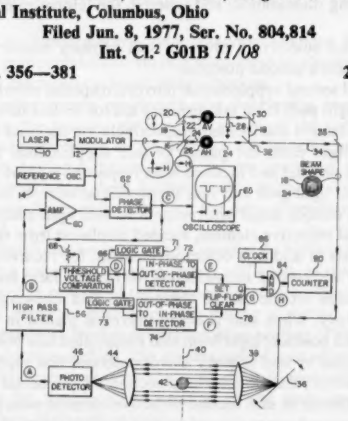
## OPTICAL EXTENSOMETER

**Ray A. Walker, Kennewick; Fred R. Reich, and James T. Russell, both of Richland, all of Wash., assignors to Batelle Memorial Institute, Columbus, Ohio**

**Filed Jun. 8, 1977, Ser. No. 804,814**

**Int. Cl.[2] G01B *11/08***

**U.S. Cl. 356—381** **24 Claims**




1. An optical dimensional measuring apparatus comprising:

pulsed light beam generating means for producing a plurality of pulsed light beams which are alternatingly time modulated at the frequency of a reference signal to provide three beam segments positioned consecutively along

a beam scanning direction with the outer two segments being distinguishable from the middle segment;

scanning means for scanning said light beams in said scanning direction across two opposite edges of an object to be measured;

detector means for detecting said light beams as they scan the opposite edges of said object to produce an electrical readout signal; and

signal processor means for processing said readout signal to produce a measurement signal output when the scanned light beams cross the opposite edges of said object.

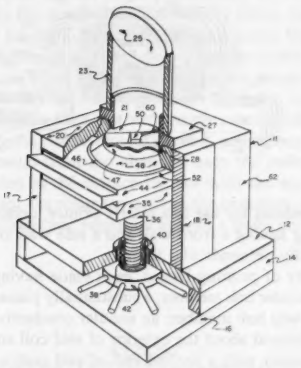
---

**4,129,385**

## PHOTOACOUSTIC SAMPLE CELL

**Allan Rosencwaig, Elyria, and Robert J. Emary, Wakeman, both of Ohio, assignors to Gilford Instrument Laboratories, Oberlin, Ohio**

**Filed Feb. 28, 1977, Ser. No. 772,728**
**Int. Cl.[2] G01N *21/24***
**U.S. Cl. 356—244** **7 Claims**



1. A sample cell for photoacoustic measurement of a solid and quasi-solid sample material in a fluid medium comprising a table and means on said table for receiving a predetermined quantity of sample material thereon, a housing into which the table is selectively inserted in a horizontal plane as to prevent physical disturbance thereto, means for moving said table vertically in said housing between a sample load position and sample test position, said sample receiving means being engageable with said housing when said table is moved to its sample test position to define therebetween a sample test chamber, positioning means interacting between said table and said housing to precisely position the sample material in said test chamber, said sample cell being formed of sufficient mass to enable the sample material to be insensitive to physical vibration, radiant energy deflecting means carried on said housing over said test chamber being operable to direct radiant energy into said chamber effective to correspondingly change the energy level of said sample material and result in like changes in the resident fluid in said chamber.

---

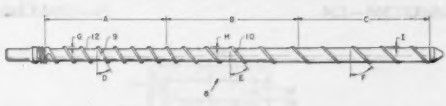
**4,129,386**

## EXTRUSION APPARATUS

**Christiaan J. Rauwendaal, Asheville, N.C., assignor to Akzona Incorporated, Asheville, N.C.**

**Continuation-in-part of Ser. No. 691,940, Jun. 1, 1976, which is a continuation-in-part of Ser. No. 585,925, Jun. 11, 1975, abandoned. This application Jun. 29, 1977, Ser. No. 811,337**
**Int. Cl.[2] A21C *1/06*; B01F *7/08***
**U.S. Cl. 366—88** **19 Claims**

1. An extrusion apparatus for processing a thermoplastic resin comprising a barrel portion with grooves within the feed section and an extruder screw extending the length of the barrel and having in sequence from the feed section end, a feed section, a transition section, and a metering section; the core of said screw being helically wound with a flight of constant helix angle in the feed section, the helix angle being between 10° and



25°, the helix angle of the flight in the metering section being constant and between 25° and 35° and the helix angle in the transition zone constantly increasing from the helix angle of the feed section to the helix angle of the metering section.

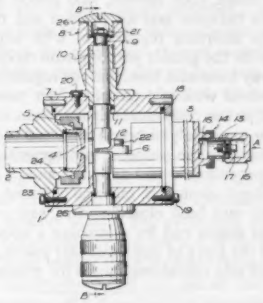
---

**4,129,387**

## APPARATUS FOR THE HOMOGENIZATION OF LIQUIDS

**Arthur Grange, and Stuart E. Booth, both of Shipley, England, assignors to Ultrasonics, Ltd., Shipley, England**

**Filed Aug. 11, 1976, Ser. No. 713,396**
**Int. Cl.[2] B01F *3/08, 11/02***
**U.S. Cl. 366—119** **6 Claims**



1. An apparatus for the ultrasonic homogenization of liquids, such as emulsions and dispersions, comprising:

(a) a body including a homogenization chamber having an inlet end and an outlet end,

(b) jet means having an orifice in the inlet end portion of said chamber for forcing liquid through said orifice along a flow axis toward said outlet end,

(c) blade means having opposite blade surfaces converging in a blade edge,

(d) mounting means supporting said blade means in said homogenization chamber for non-rotary, vibratory movement and positioning said blade edge opposite said orifice and in aligment with the flow axis of liquid through said orifice, so that liquid flowing from said orifice impinges on said blade edge and passes over said opposite blade surfaces toward said outlet end,

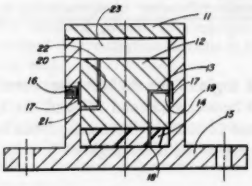
(e) at least one tuning member in said homogenization chamber having a tuning surface opposing at least one of said blade surfaces,

(f) adjustment means on said body supporting said tuning member for relative movement of said tuning surface toward and away from said blade surface to contain the flow of liquid between said tuning member and said blade means.

## 4,129,388
## VIBRATOR FOR FLOWING GRANULAR MATERIAL

Ronald H. McKee, 2614 N. Galvez St., New Orleans, La. 70117

Filed Jul. 25, 1977, Ser. No. 818,622
Int. Cl.[2] B06B 1/18
U.S. Cl. 366—124 3 Claims



1. An impact type pneumatic piston vibrator comprising in combination:

(a) a vibrator housing defining an elongated cylinder with round walls and oppositely disposed closed ends, and a base normal to said cylinder at one of said closed ends for attaching said vibrator housing to an exterior surface of any containing means for granular material;

(b) a peripheral air passage defined interiorly in said round walls intermediate said cylinder closed ends for receiving compressed air;

(c) means for introducing compressed air through said cylinder circular wall into said peripheral air passage;

(d) an elongated piston slidably mounted in said cylinder and adapted to be reciprocated between said oppositely disposed closed ends thereof, said piston defining two air conduits between said air passage and respective piston ends for alternate registration with said peripheral air passage for the greater part of piston reciprocation toward and away from said base, and for registration of both said air conduits with said peripheral air passage for a lesser part of piston reciprocation near the closed end of said cylinder oppositely disposed from said base closed end for air cushioning the piston at said oppositely closed end in its reciprocation in said cylinder; and

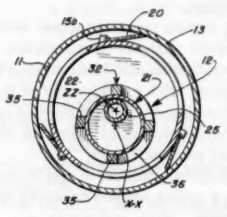
(e) a resilient elastomer material adapted to be mounted between said base closed end of said cylinder and the adjacent piston end for absorbing a noise of impact and little of the force of impact of said piston on said base end adjacent said containing means for granular material.

---

## 4,129,389
## AGITATOR CONSTRUCTION

Alden H. Wakeman, Lake Mills, and Leonard R. Heiliger, Fort Atkinson, both of Wis., assignors to Crepaco, Inc., Lake Mills, Wis.

Filed Jan. 30, 1978, Ser. No. 873,214
Int. Cl.[2] B01F 7/12
U.S. Cl. 366—144 9 Claims



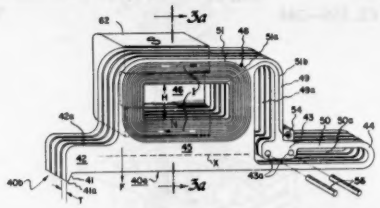
1. An agitator construction for use within an elongated skeletal dasher assembly rotatable about its longitudinal axis, the dasher assembly being disposed within an elongated cylindrical chamber through which a viscous product is caused to flow; said agitator construction comprising an elongated imperforate cylindrical support unit fixedly mountable within the dasher assembly, the central longitudinal axis of the support unit being offset with respect to the rotary axis of the dasher assembly; and an elongated cagelike member mounted on and in close encompassing relation substantially throughout said support unit for independent rotation about the central longitudinal axis of said support unit in response to the rotation of the dasher assembly and the product flow through the chamber.

---

## 4,129,390
## STACKED BLADE MATRIX PRINTER HEADS

John E. Bigelow, Rexford, and Donald C. Peroutky, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 687,985, May 19, 1976, abandoned.
This application Oct. 25, 1977, Ser. No. 845,425
Int. Cl.[2] B41J 3/12
U.S. Cl. 400—121 7 Claims



1. A printhead for use in a matrix printer, comprising:

a housing having a front wall and a side wall arranged substantially perpendicular thereto;

a plurality of printing blades, each blade having a conductive annular hub member; a substantially planar coil would about said hub member; an annular conductive rim member disposed about the exterior of said coil and in electrical contact with a second end of said coil; a conductive mounting portion positioned in the plane of and spaced from said coil; a pair of conductive elongated resilient arms having opposed first and second ends, the first end of each arm joined to each of a pair of spaced locations on the exterior of said rim member and the second end of each arm joined to said mounting portion, said arms electrically connecting said mounting portion of said second end of said coil and supporting said coil and the hub and rim members for movement relative to said mounting portion; and a printing tip extending from the exterior of said rim member in a first direction substantially perpendicular to the elongated dimension of that one of said arms closest to said tip;

said plurality of blades being stacked with the planes thereof parallel to one another and said mounting portions in parallel alignment;

first means for rigidly fastening only the parallel stacked mounting portions of all said blades to said housing side wall with the plane of each said blade substantially perpendicular to both said front and side walls and with said printing tips aligned along a common line; and

second mens positioned only outside the stack of blades for forming a single permanent magnetic field directed to all of the coils of the entire stacked plurality of printing blades;

a plurality of terminal means insulatively fastened to said housing; and

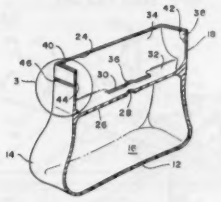
means for electrically connecting the hub member of each said printing blade to one of said terminal means;

a flow of current through a coil of one of said blades interacting with said single permanent magnetic field to move the printing tip of that blade in said first direction and outwardly from said front wall of said housing.

## 4,129,391
## INTEGRAL APPLICATOR STRUCTURE

Robert J. Gamacher, 33185 W. Warren, Westland, Mich. 48135

Filed Jan. 23, 1975, Ser. No. 543,427
Int. Cl.[2] B05C *17/00;* B43M *11/02;* B44D *3/28*
U.S. Cl. 401—208 12 Claims



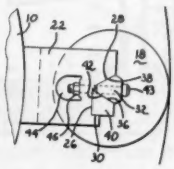
1. Applicator structure comprising a container including a chamber for a cosmetic such as suntan lotion, an elongated slot in the container, a roller rotatably mounted in and extending radially from the slot including a radially outer compressible portion and having a diameter extending across the width of the slot of slightly greater dimension than the width of the slot at the diameter of the roller means extending across the width of the slot whereby the roller means is under compression across the width of the slot and length substantially equal to the corresponding dimension of the slot, and means for directing the cosmetic from the chamber onto the roller over the greater portion of the surface thereof with the applicator inverted to place the roller lower than the container on rotating the roller in frictional engagement with a body portion.

---

## 4,129,392
## ROLLING CUTTER ARRANGEMENT

Homer B. Lupton, Mercer Island, Wash., assignor to Subterranean Tools Inc., Denver, Colo.

Filed Mar. 24, 1978, Ser. No. 889,722
Int. Cl.[2] E21B *9/12*
U.S. Cl. 403—25 4 Claims

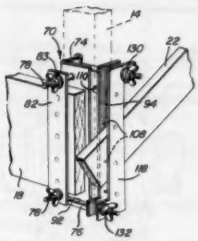


1. A mounting arrangement for a rolling cutter, especially a gauge cutter, which comprises; a saddle having a first sloping wall, a base portion joining said first sloping wall and an abutment region facing said first sloping wall, said rolling cutter having a shaft whose ends have converging side walls, a wedge block seated on said base portion of said saddle and having a second sloping wall converging with and facing said first sloping wall, said wedge block held in a predetermined position relative to said first sloping wall by backing on said abutment region on said saddle, said converging side walls of said shaft ends mating with said first and second converging sloping walls and means holding and urging said shaft ends to said saddles, and said rolling cutter shaft ends converging toward said saddle when said rolling cutter is mounted on said saddle and said first and second sloping walls converging toward said saddle.

## 4,129,393
## SCAFFOLD LUMBER CLAMPS

Jack R. Sickler, P.O. Box 20803, Billings, Mont. 59104

Filed Jul. 25, 1977, Ser. No. 818,815
Int. Cl.[2] E04G *7/00*
U.S. Cl. 403—49 7 Claims



1. A scaffold lumber clamp assembly including an elongated angle member comprising first and second right angularly disposed elongated flanges integrally joined together along adjacent longitudinal edge portions and including inner and outer included and excluded angle sides, respectively, the opposite ends of one of said flanges including a pair of outstanding threaded studs anchored relative thereto and projecting outwardly from the outer side thereof, a first elongated clamp bar paralleling the outer side of said one flange and including opposite end openings formed therein through which said studs are slidingly received, and a pair of first threaded abutment members threadedly engaged on said studs outwardly of the side of said clamp bar remote from said one flange and abuttingly engageable with said clamp bar about said openings, one end of said one flange including a threaded shank anchored relative thereto and projecting endwise outwardly from the corresponding end portion of the longitudinal edge of the one flange remote from the other flange, the end of the other flange remote from said one end of said one flange having one end portion of a threaded bolt pivotally anchored thereto adjacent the free longitudinal edge of said other flange remote from said one flange for swinging of said bolt about an axis generally paralleling the free longitudinal edge and extending transversely of said bolt between a free position generally paralleling said one flange and a second position projecting endwise outwardly of said free longitudinal edge of said other flange and generally paralleling the latter, and second and third inner and outer elongated clamp bars paralleling said second flange and including corresponding first and second ends, said first ends having registered openings formed therein through which the outer free end portion of said threaded shank is slidingly received, a second threaded abutment member threadedly engaged on the outer end of said shank outwardly of said outer clamp bar and abuttingly engageable with the outer side of said outer bar, said second ends of said second and third bars including registered notches formed therein opening laterally outwardly through the longitudinal side edges of said second and third bars corresponding to said free longitudinal edge of said other flange and into which the free end portion of said threaded bolt is receivable when said bolt is swung from said second position to said first portion, and a third threaded abutment member threadedly engaged on the free end portion of said bolt and abuttingly engageable with the side of said outer clamp bar remote from said inner clamp bar.

**4,129,394**

## PIVOT PIN FOR JOINTS, PARTICULARLY UNIVERSAL JOINTS OR THE LIKE

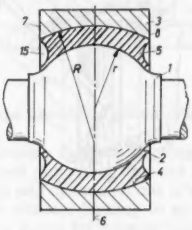
**Johann Eichinger, Putzbrunn, and Manfred Hirt, Munich, both of Germany, assignors to Carl Hurth Maschinen- und Zahnradfabrik, Munich, Germany**

**Filed Jun. 23, 1977, Ser. No. 809,195**

**Claims priority, application Fed. Rep. of Germany, Jul. 5, 1976, 2630205**

**Int. Cl.[2] F16D *3/00*; E21B *19/16***

**U.S. Cl. 403—57** **5 Claims**




1. A pivotal joint having limited universal movement, comprising:

an inner pin member having a continuous first annular surface portion thereon extending radially outwardly of said pin member with its largest radial dimension being located at a point intermediate in its axial length;

a monolithic outer hub member having a continuous annular second surface which surrounds, is centrally disposed with respect to and is radially spaced from said first surface of said inner pin member, said first and second surfaces being convergingly related from the axial ends thereof to the points intermediate their axial lengths;

a single layer of flexible resilient material disposed in the annular space between said inner pin member and said outer hub member, said flexible resilient material being bonded to said first and second surfaces and having a uniform radial compression characteristic throughout the entire axial length of said flexible resilient material, said flexible resilient material having an axial cross section in said annular space which converges from the axial ends thereof to the point intermediate its axial length at a rate such that, upon a relative movement between said inner pin member and said outer hub member, said flexible resilient material is displaced and each planar section of said flexible resilient material contained in planes perpendicular to the axis of said inner pin member undergoes generally the same form change and the volume of the displaced flexible resilient material of a first plane plus the volume of the displaced flexible resilient material of an adjacent second plane is absorbed by the volume between said first and second surfaces between said first and second planes.

---

**4,129,395**

## CONTAINER LOCK ASSEMBLY

**John Theurer, Alpine; William C. Guenzel, New Brunswick, both of N.J., and Orville F. Beck, Downingtown, Pa., assignors to Theurer Atlantic Incorporated, Newark, N.J.**

**Filed Jul. 5, 1977, Ser. No. 812,897**

**Int. Cl.[2] B25G *3/18*; F16B *21/02, 21/14***

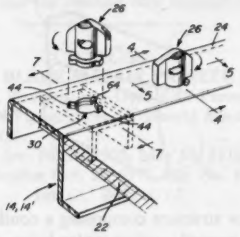
**U.S. Cl. 403—317** **8 Claims**

1. A container lock assembly, comprising, in combination:

(a) a rail mountable on a vehicle frame;

(b) a body member including a base portion removably engaged with the rail, and a stem portion extending away from the base portion; and

(c) lock pin means removably attached to the stem portion of the body member for retaining in place against the rail a container to be secured to the rail, the stem portion of the body member having a through hole disposed perpendicularly to the extent of the stem portion, the lock pin means being removably arranged within the hole provided in the stem portion of the body member, the base portion of the body member including a shank extending from the stem portion, and a pair of tabs depending from the shank in a




common plane spaced from the stem portion, the rail being provided with a cutout, and the tabs being arranged for fitting into the cutout provided in the rail and engaging with and disengaging from the rail upon a rotating motion of the body member about the longitudinal extent of the stem portion.

---

**4,129,396**

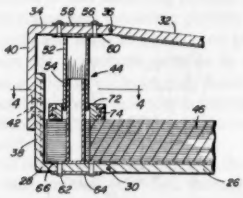
## LOOSE LEAF BINDER WITH RIGID TELESCOPIC POST ASSEMBLIES AND MAGNETICALLY RETAINED BAR

**James P. Stecklow, 8558 Broadview Rd., Broadview Heights, Ohio 44147**

**Filed Apr. 28, 1977, Ser. No. 792,036**

**Int. Cl.[2] B42F *3/02, 3/30***

**U.S. Cl. 402—46** **8 Claims**



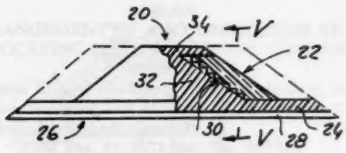

1. A loose leaf binder for loose leaf sheets or brochures and enabling individual sheets or brochures to be removed or added without taking the binder apart and without removing additional sheets or brochures, said binder comprising a supporting base, a top member spaced from the base and adapted to receive a plurality of loose sheets of material therebetween, a plurality of post assemblies extending between the supporting base and top member for receiving and mounting the loose leaves, each post assembly including a pair of tubular members with one of the tubular members being supported from the supporting base and the other of the tubular members being supported from the top member, the inner ends of the tubular members being disposed in telescoping relation to enable variation in the length of each post assembly, and a hold down means which adheres to at least one of said tubular members and is adjustable relative thereto for holding said sheets or brochures in place by exerting pressure thereon.

## 4,129,397

## ROAD SURFACE MARKING PREFABRICATED TAPE MATERIAL, HAVING RETROREFLECTIVE COMPOSITE ELEMENTS ASSOCIATED THERETO

Ludwig Eigenmann, Vacallo, Canton Ticino, Switzerland

Filed Nov. 9, 1977, Ser. No. 850,024
Claims priority, application Italy, Nov. 10, 1976, 29196 A/76
Int. Cl.[2] E01F 9/04
U.S. Cl. 404—14 8 Claims




1. A prefabricated road-surface marking tape, comprising a tape adapted to be placed on and secured to a road surface to form a traffic aid thereon; a plurality of reflectors spaced lengthwise of and upwardly projecting from an upper face of said tape, each of said reflectors comprising a casing having a generally planar base portion of a first width and having a bottom face juxtaposed with said upper face, and a receiver portion of a smaller second width projecting upwardly from said base portion, and an optically reflective element mounted and sheltered in said receiver portion and operative for retroreflecting a relatively narrow beam of light lengthwise of said tape in one direction when impinged by vehicle-emitted light rays travelling in the opposite direction; and means including a plurality of recesses in said bottom face and accommodating portions of said tape therein, for fixedly anchoring said reflectors to said tape.

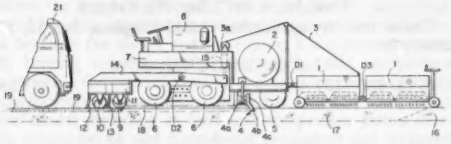
---

## 4,129,398

## METHOD AND APPARATUS FOR PLASTIFYING AND TEARING UP OF DAMAGED ROAD-SURFACES AND COVERS

Walter Schoelkopf, Bruehlstrasse 38, 7024 Filderlinden, Fed. Rep. of Germany

Filed Nov. 26, 1976, Ser. No. 745,122
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1975, 2554710; Oct. 25, 1976, 2648158
Int. Cl.[2] E01C 23/14
U.S. Cl. 404—95 8 Claims



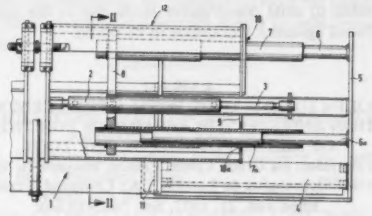
1. An apparatus for resurfacing a road including a mobile apparatus for breaking up a road surface and distributing a layer of broken-up material on said road surface, said mobile apparatus comprising a main frame having a forwardly extending cantilever arm, a heating unit pivotally mounted to the front end of said cantilever arm, road surface breaking-up means adjustably mounted to said cantilever arm, and steering means further mounted on said cantilever arm, said apparatus further comprising broken-up material distributing means, and means pivotally mounting said distributing means to said main frame behind said breaking-up means, and means for adjusting the position of said distributing means, said broken-up material distributing means comprising means for rearranging and distributing broken-up material from said breaking-up means on a road surface.

## 4,129,399

## MOUNTING BARS FOR ROAD MAKING MACHINES

Hans Ruge, Wardenburg, Fed. Rep. of Germany, assignor to Firma Klaus-Gerd Hoes, Wardenburg, Fed. Rep. of Germany

Filed Nov. 14, 1977, Ser. No. 851,236
Int. Cl.[2] E01C 19/22
U.S. Cl. 404—118 8 Claims



1. A device for adjusting the working width of a road making machine comprising:

a main bar having an elongated front wall and two lateral ends;

a pair of adjuster bars disposed rearwardly of said front wall of said main bar, each of which is associated with an opposite end of said main bar and which is reciprocably movable laterally away from and toward said associated end of said main bar so as to serve as an extension for said main bar and to cooperate therewith for adjusting the working width;

at least one pair of guide tubes each of which is associated with an opposite end of said main bar and in each of which one of said adjuster bars is at least partially and telescopically received and supported therein for reciprocal sliding movement and telescopic extension and retraction from one end thereof; and

mounting means for slidably mounting said guide tubes on said main bar for lateral reciprocal movement in the same direction of extension and retraction of the adjuster bar supported therein, and mounting means being coupled between said main bar and an end of said tubes remote from said one end thereof, said slidable guide tubes cooperating with said adjuster bars and said main bar for adjusting the working width.

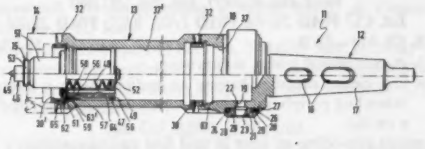
---

## 4,129,400

## TREPANNING TOOL

Tiberius M. Wozar, Waldackerweg 5, 7300 Esslingen-Wiflingshausen, Fed. Rep. of Germany

Filed Nov. 23, 1976, Ser. No. 744,269
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1975, 2553035; Oct. 29, 1976, 2649399
Int. Cl.[2] B23B 51/06, 41/02
U.S. Cl. 408—56 12 Claims



1. A trepanning tool which includes

an elongated shank, at least one end of which is formed by a hollow body, and which defines a central boring axis;

cutting elements connected to the end of said elongated shank formed by said hollow body;

a centering element axially movably positioned within said hollow body portion of said elongated shank, said centering element including a guide piston, a centering spigot,

and springs positioned between said centering element and said guide piston such that said centering spigot is relatively movable with respect to said guide piston; and

means provided in said hollow body portion of said elongated shank forming a radial aperture therein for allowing coolant medium into said hollow body portion and act to resist axial movement of said centering element when said trepanning tool is used and said centering element is subjected to axial compressive loads due to the tool being placed against a workpiece to be bored.

---

**4,129,401**

## HOLE-CUTTING TOOL WITH A FREE CENTRAL PORTION AND EJECTOR APPARATUS FOR THE CORE OF METAL FORMED BY THE TOOL

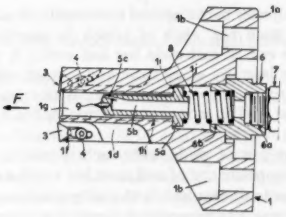
**Pierre Berthier, La Grand Croix, France, assignor to Manufacture de Vilebrequins de Lorette S.A., Chamond, France**

**Filed Jun. 27, 1977, Ser. No. 810,841**

**Claims priority, application France, Jul. 7, 1976, 76 21553**

**Int. Cl.[2] B23B** *27/10, 51/00, 41/02*

**U.S. Cl. 408—59** **9 Claims**



1. A hole-forming tool comprising a body adapted for being driven in rotation, said body including a front portion having an axial bore, a plurality of cutting plates removably secured to said front portion for cutting a ring from a metal workpiece while leaving a non-cut core in the axial bore, ejector means in said bore for ejecting said core at the end of the cutting operation, and means for axially distributing a liquid through said bore, said ejector means comprising an ejector member slidable in said bore, and resilient means urging said ejector member into said bore for ejection of the core, said body having a chamber communicating with the means for axially distributing the liquid, said ejector member having a blind axial bore communicating with said chamber, and orifices extending into said bore and opening at said body at the front face thereof which faces the core.

---

**4,129,402**

## SELF-PRIMING CENTRIFUGAL TRASH PUMP

**Harry A. Eberhardt, Paoli, Pa., assignor to Hale Fire Pump Company, Conshohocken, Pa.**

**Filed Jan. 5, 1977, Ser. No. 757,060**

**Int. Cl.[2] F04D** *29/44;* **F01D** *1/02, 9/02;* **F04D** *29/08*

**U.S. Cl. 415—53 R** **19 Claims**

1. A centrifugal pump, comprising:

a first casing member having an endwall with a laterally-extending peripheral flange cooperating therewith to form a cavity,

means providing an inlet in said first casing member,

means providing an outlet in said first casing member,

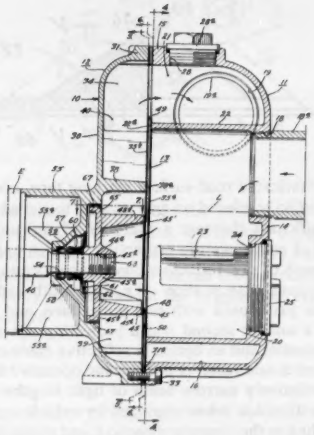
a baffle extending around said inlet means and into said cavity to divide said cavity into an inlet plenum in fluid communication with said inlet means and an outlet plenum in fluid communication with said outlet means,

a second casing member having an endwall with a laterally-extending peripheral flange cooperating therewith to form a recess,

a volute-shaped wall extending into said recess to divide said recess into a pumping chamber interiorly thereof and a discharge chamber exteriorly thereof,

a divider plate interposed between said first and second casing members and extending transversely across said partition and volute-shaped wall,

said divider plate having an orifice below said inlet means providing fluid communication between said inlet plenum and said pumping chamber and having a vent providing fluid communication between said discharge chamber and said outlet plenum.



said divider plate, baffle, and said casing member fastening means being disposed symmetrically with respect to a vertical axis through the pump assembly to enable the divider plate to be reversed in position between the casing members,

impeller means rotatably mounted in said pumping chamber, and

means releasably fastening said first and second casing members together with said divider plate therebetween,

whereby rotation of the impeller causes fluid to flow through the pump.

---

**4,129,403**

## HELICOPTER ROTORS

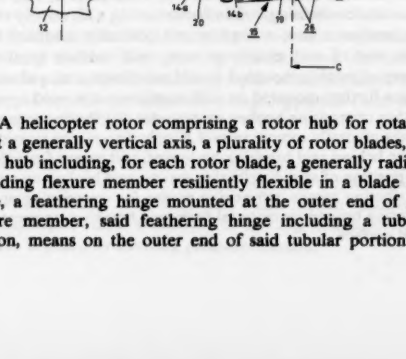
**Kenneth Watson, Yeovil, England, assignor to Westland Aircraft Limited, Yeovil, England**

**Filed Jul. 8, 1977, Ser. No. 814,038**

**Claims priority, application United Kingdom, Jul. 15, 1976, 29587/76**

**Int. Cl.[2] B64C** *27/38, 27/48*

**U.S. Cl. 416—134 A** **12 Claims**



1. A helicopter rotor comprising a rotor hub for rotation about a generally vertical axis, a plurality of rotor blades, the rotor hub including, for each rotor blade, a generally radially extending flexure member resiliently flexible in a blade flap plane, a feathering hinge mounted at the outer end of said flexure member, said feathering hinge including a tubular portion, means on the outer end of said tubular portion for

attachment of a rotor blade, a spindle extending outwardly from said flexure member with the outer end portion thereof disposed within said tubular portion, inner and outer elastomeric bearings disposed in spaced apart relationship on said spindle and supporting said tubular portion and an elastic shear mounting disposed adjacent said outer elastomeric bearing and mounted between said tubular portion and said outer bearing to permit lead and lag movements of the tubular portion and rotor blade about a geometrical center of said inner bearing.

---

## 4,129,404
## ARRANGEMENT OF AIR COMPRESSOR AT A RECIPROCATING PISTON INTERNAL COMBUSTION ENGINE

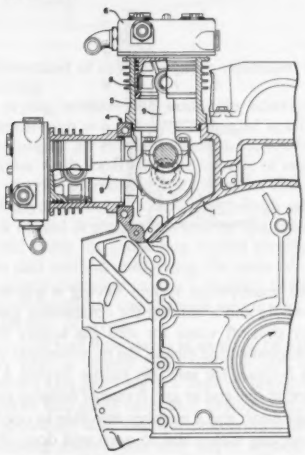
**Wolf-Dietrich Körner, Hochberg, Uber Ludwigsburg, and Otto Hartmann, Stuttgart, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany**

**Filed Jan. 19, 1971, Ser. No. 107,738**

**Claims priority, application Fed. Rep. of Germany, Jan. 21, 1970, 2002470**

**Int. Cl.**[2] **F04B** *35/00, 17/00*

**U.S. Cl. 417—364** **9 Claims**



1. An air compressor arrangement for use with a piston-type internal combustion engine of the type having an engine crankshaft, an engine output side, and a clutch means arranged adjacent the engine output side; said arrangement comprising: control housing means arranged at the output side of the engine between the clutch and the engine, a compressor crankshaft bearing means rotatably supporting said compressor crankshaft in the control housing means, compressor cylinder means including at least one compressor cylinder, compressor piston means including at least one compressor piston drivingly connected to said compressor crankshaft and arranged for reciprocating movement within the respective at least one compressor cylinder in response to rotation of said compressor crankshaft, compressor cylinder connecting means for detachably connecting said compressor cylinder means to said control housing means, and compressor crankshaft driving means operatively connected to the engine crankshaft for rotatably driving said compressor crankshaft, wherein said control housing means is an integral housing structure which accommodates engine auxiliary units such as control wheels for camshafts and the like and an engine flywheel as well as the compressor crankshaft, wherein said compressor crankshaft driving means includes a compressor gear directly and drivingly engaging a camshaft gear of the engine, wherein said compressor gear is attached to a first end of said compressor crankshaft for rotation about the rotational axis of the compressor crankshaft, wherein said bearing means includes a common roller bearing means which supports and centers both said first end and said compressor gear, and wherein said bearing means further includes an anti-friction bearing in supporting engagement with the second end of said compressor crankshaft, wherein means are provided for feeding pressure oil to said anti-friction bearing, wherein connecting rod means are provided for interconnecting said compressor piston means with said compressor crankshaft and wherein oil channels are provided for communicating the pressure oil from the anti-friction bearing to connecting rod bearing means on said connecting rod means.

---

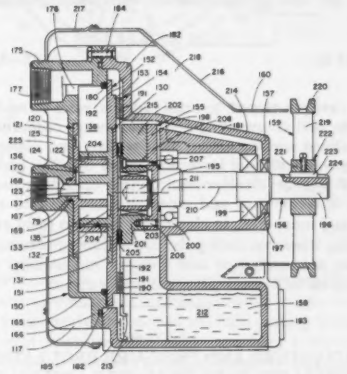
## 4,129,405
## SCROLL-TYPE LIQUID PUMP WITH TRANSFER PASSAGES IN END PLATE

**John E. McCullough, Carlisle, Mass., assignor to Arthur D. Little, Inc., Cambridge, Mass.**

**Filed Jun. 17, 1977, Ser. No. 807,413**

**Int. Cl.**[2] **F04C** *11/02, 15/02;* **F01C** *21/04, 21/06*

**U.S. Cl. 418—55** **46 Claims**



1. A scroll element suitable for forming a scroll member in a liquid scroll pump, comprising in combination

(a) an end plate;

(b) an involute wrap of one and one-half involute turns affixed to one surface of said end plate; and

(c) recessed liquid transfer passage means cut in said one surface of said end plate, said recessed liquid transfer passage means being defined along one principal boundary by a partial tracing of an involute wrap edge of a mating scroll element.

---

## 4,129,406
## MOLD FOR THE VULCANIZATION OR RETREADING OF VEHICLE TIRES

**Floriano Capecchi, Pistoia, Italy, assignor to CIMA Costruzioni Industriali Metalmeccaniche e Affini S.A.S. di Capecchi Floriano & C., Italy**

**Continuation-in-part of Ser. No. 740,055, Nov. 8, 1976, abandoned. This application Dec. 7, 1977, Ser. No. 858,374**

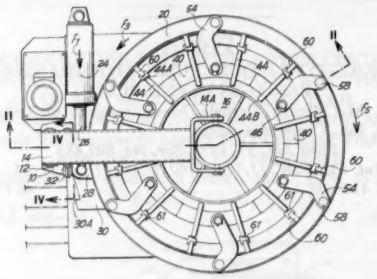
**Claims priority, application Italy, Nov. 25, 1975, 9626 A/75; Jul. 12, 1977, 9518 A/77**

**Int. Cl.**[2] **B29H** *5/02, 5/08*

**U.S. Cl. 425—46** **10 Claims**

1. A pneumatic tire mold, comprising, in combination, a lower disc-like plate; an upper disc-like plate; an inner chill disposed between said plates to define the inner periphery of a tire-receiving mold cavity; a plurality of outer chill sectors matingly engageable with each other and with said inner chill to define the outer periphery of the mold cavity; means mounting said upper plate for movement relative to said outer chill sectors to open the mold; means mounting said outer chill sectors for guided radial movement relative to said inner chill;

an angularly displaceable, axially fixed operating ring surrounding said outer chill sectors; respective linkages connecting each outer chill sector mounting means to said operating ring and operable, responsive to angular displacement of said operating ring, to move said outer chill sectors radially relative to said inner chill; ring operating control means connected to said operating ring to angularly displace said operating ring; cooperating abutment means on said operating ring and said outer chill sector mounting means interengageable, when the



mold cavity is closed, to resist radial stresses on said outer chill sectors; said cooperating abutment means comprising at least an inclined surface acting as a wedge; and clamping means engageable with said lower and upper disc-like plates, responsive to angular displacement of said operating ring effecting radial movement of said outer chill sectors into engagement with said inner chill, to clamp said plates to resist axial stresses thereon; whereby, during the tire molding operation, no radial stresses are exerted on said linkages and no axial stresses are exerted on said upper plate mounting means.

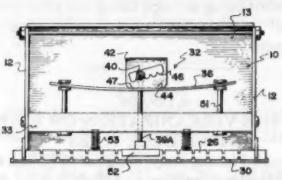
---

**4,129,407**

## CURVATURE AND PRESSURE REGULATOR FOR TROWELLING BARS OF MASTIC APPLICATOR AND FINISHING TOOLS

**John W. Golls, St. Albert, and Peter Griep, Edmonton, both of Canada, assignors to Custom Tool & Die Ltd., Edmonton, Canada**

**Filed Dec. 13, 1977, Ser. No. 859,998**
**Int. Cl.[2] B28B *3/00*; B29C *3/04*; B05C *17/10*; E01C *19/12***
**U.S. Cl. 425—87** **12 Claims**



1. In a mastic applicator and finishing tool movable over a surface for discharging mastic on the surface and which includes a resilient trowelling bar carried by the tool for trowelling a crown on the discharged mastic; the improvement which comprises means to regulate, within limits, the curvature of the trowelling bar, said means including a ramp component mounted for sideways movement relative to said trowelling bar, a notched ramp formed in said component extending at an angle inclined to the longitudinal axis of the trowelling bar and means interposed between said notched ramp and said trowelling bar and selectively engageable with said notched ramp whereby pressure upon said trowelling bar is progressively increased when said notched ramp component is moved sideways in one direction and decreased when said notched ramp component is moved sideways in the opposite direction, said last mentioned means including a resilient strip having a first support means adjacent each end of said strip and a second support means intermediate the ends of said strip, one of said support means being operatively connected to said ramp component, the other of said support means being operatively connected to said trowelling bar.

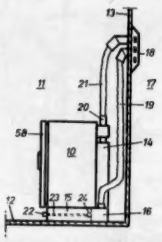
---

**4,129,408**

## GAS BURNER LIGHTING DEVICE FOR AN ABSORPTION REFRIGERATING APPARATUS

**John R. Hammar, Molle, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden**

**Filed Oct. 21, 1976, Ser. No. 734,549**
**Claims priority, application Sweden, Nov. 20, 1975, 75130617**
**Int. Cl.[2] F23D *11/36***
**U.S. Cl. 431—251** **3 Claims**



1. In a sealed combustion system having a gas burner, a source of gas supply and a conduit for conducting gas to said burner, a safety shut-off valve for said gas supply provided with a manual disconnecting means, the improvement comprising; a frame, a housing for said gas burner having a door, a spring connected at one end to said frame or housing and at the other end to said door, and a member movable to operate said manual disconnecting means and to open said door of the gas burner housing to the atmosphere against the pressure of said spring, said movable member being a pressure plate that moves to establish communication between said gas burner housing and the atmosphere first before operating said manual disconnect means, the latter permitting a supply of gas to be furnished to said gas burner.

---

**4,129,409**

## ARSENIC CONTAINING FUELS

**Dean A. Young, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.**

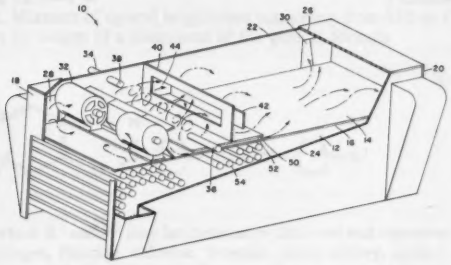
**Division of Ser. No. 669,314, Mar. 22, 1976, Pat. No. 4,040,797.**
**This application Apr. 13, 1977, Ser. No. 787,002**
**Int. Cl.[2] C10L *9/00***
**U.S. Cl. 431—3** **9 Claims**

1. The process of combusting a solid or liquid hydrocarbonaceous or carbonaceous fuel containing at least 2 ppmw As comprising injecting one or more metallic components selected from the class consisting of the metals and compounds of Mg, Ba, Ni, and Zn into a turbulent stream of said fuel, and subtantially immediately thereafter, combusting said fuel, said injecting being conducted such that a larger proportion of the As contained in said fuel is retained in the ash produced therefrom than is retained when said fuel is combusted alone.

## 4,129,410
## METHOD OF DRYING GYPSUM WALLBOARD AND APPARATUS THEREFOR

**Chester R. Nowick, Williamsville, and Alfred de Franza, Buffalo, both of N.Y., assignors to National Gypsum Company, Dallas, Tex.**

**Continuation-in-part of Ser. No. 668,085, Mar. 18, 1976, Pat. No. 4,050,885. This application Aug. 17, 1977, Ser. No. 825,403**
**Int. Cl.[2] F27B *17/00***
**U.S. Cl. 432—31** **6 Claims**



1. The method of drying gypsum wallboard in a wallboard dryer having

(1) a drying section with means for conveying wallboard therethrough at a plurality of spaced apart levels, and

(2) an elongate gas reheating plenum section having elongate exterior walls separating the interior of said plenum from the exterior thereof, having means for moving gases from said dryer section into and on through said plenum and back to said dryer section, and having combustion means in said walls for propelling heated products of combustion, said method comprising the steps of

(a) continuously conveying a plurality of undried gypsum wallboards into and through said drying section at said plurality of levels,

(b) drying said wallboards at an equal rate at all said levels by passing heated gases through said drying section, which said gases are at a uniform temperature throughout as said gases enter said drying section,

(c) providing said uniform temperature heated gases by moving gases from said dryer section through said means for moving gases and from said moving means on through said plenum whereat said means for propelling heated products of combustion directs heated products of combustion crosswise of said plenum at an angle of from about 45° to about 135° to the direction of flow of said gases from said moving means, and mixing said heated products of combustion thoroughly with substantially all of said gases by the turbulence caused by the combination of said combustion and said crossed directions of flow of said products of combustion and substantially all of said gases to be heated, lowering the temperature of said products of combustion to about 550° F. upon being mixed with said gases which intersect with said flow of products of combustion, and

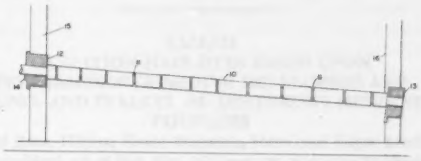
(d) propelling said heated products of combustion by feeding fuel and air through a sonic nozzle, and creating intense sonic waves at the outlet portion of said sonic nozzle whereby said fuel is caused to be divided into extremely fine particles, creating a high intensity flame which contributes to the propelling of said products of combustion.

---

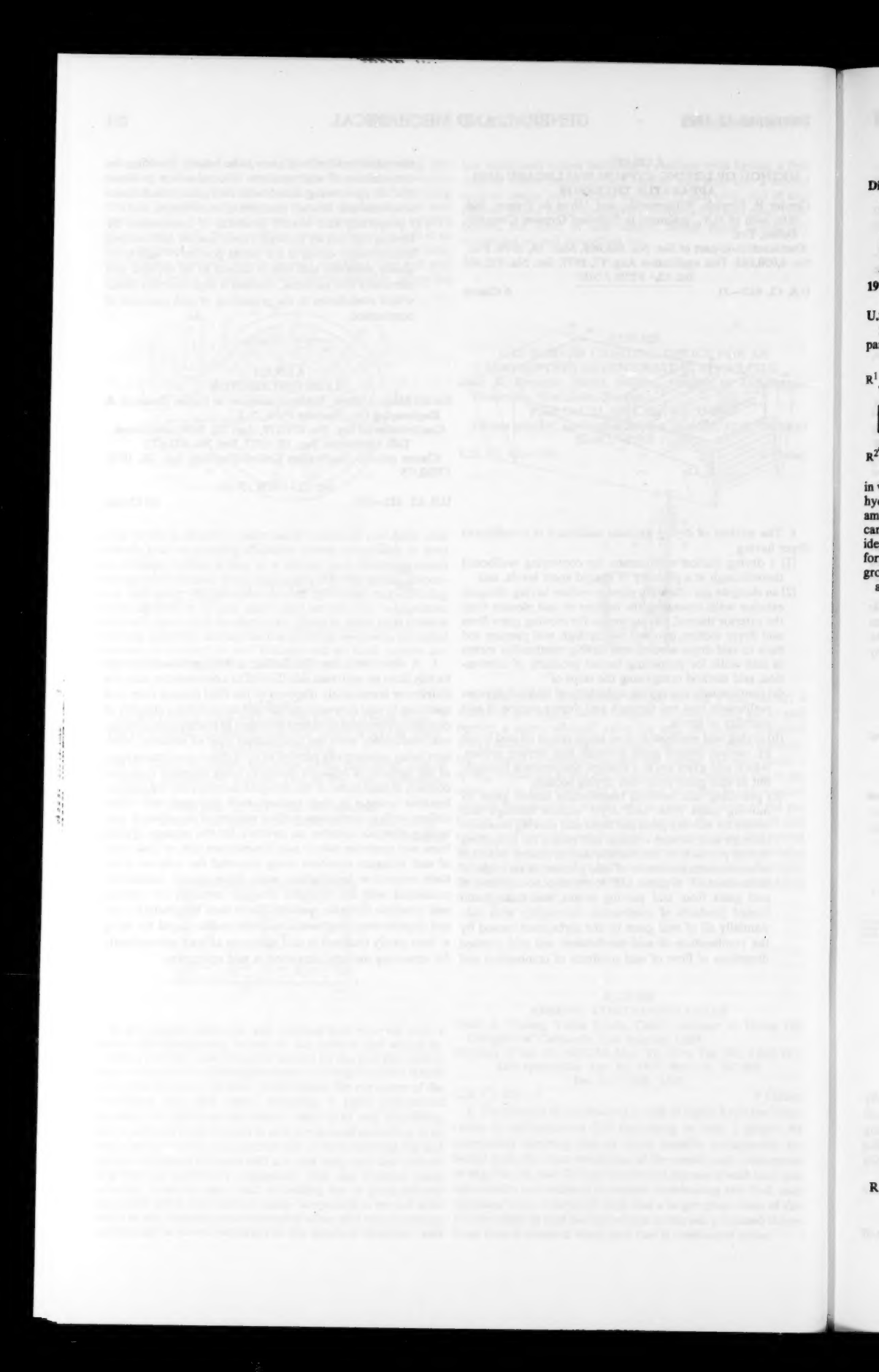
## 4,129,411
## FLUID DISTRIBUTOR

**Gerald Moss, Oxford, England, assignor to Exxon Research & Engineering Co., Florham Park, N.J.**

**Continuation of Ser. No. 679,179, Apr. 22, 1976, abandoned. This application Sep. 15, 1977, Ser. No. 833,672**
**Claims priority, application United Kingdom, Apr. 24, 1975, 17032/75**
**Int. Cl.[2] F27B *15/00***
**U.S. Cl. 432—58** **10 Claims**



1. A distributor for distributing a fluid substantially uniformly from an upstream side thereof to a downstream side, the distributor transversely disposed of the fluid passing from said upstream to said downstream side and comprising a plurality of elongate cylindrical members arranged in side-by-side contiguous relationship with the longitudinal axes of adjacent members being substantially parallel to each other, contiguous parts of the surfaces of adjacent members being disposed in mutual contact, at least some of the elongate members having circumferential recesses in their surfaces such that each said recess defines with a contiguous surface portion of an adjacent contacting elongate member an aperture for the passage of fluid from said upstream side to said downstream side, at least some of said elongate members being mounted for rotation about their respective longitudinal axes, drive means operatively connected with the rotatable elongate members for rotating said rotatable elongate members about their longitudinal axes, and deposit-removing means mounted and arranged for being at least partly received in said apertures at least intermittently for removing material deposited in said apertures.



## 4,129,412
## BRIGHTENER MIXTURES AND THEIR USE

**Dieter Günther, Kelkheim; Erich Schinzel; Rüdiger Erckel, both of Hofheim am Taunus, and Gunter Rösch, Bad Soden am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

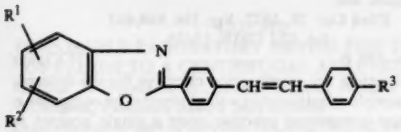
**Filed Jun. 28, 1977, Ser. No. 811,145**

**Claims priority, application Fed. Rep. of Germany, Jul. 2, 1976, 2629703**

**Int. Cl.[2] D06P *1/38***

**U.S. Cl. 8—1 W** **3 Claims**

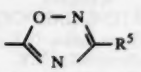
1. Mixtures of optical brighteners containing from 0.05 to 1 part by weight of a compound of the general formula



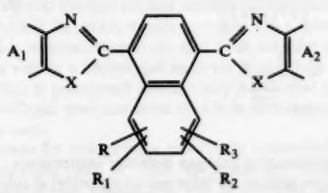
(I)

in which $R^1$ and $R^2$ may be identical or different and represent hydrogen, fluorine, chlorine, bromine, alkyl, alkoxy, dialkylamino, trialkylammonium, alkanoylamino, cyano, carboxyl, carboalkoxy, carboalkoxyalkoxy, carbophenoxy, or carbonamide, two adjacent radicals $R^1$ and $R^2$ together possibly also forming a benzo ring, an alkylene or a 1,3-dioxapropylene group,

and $R^3$ stands for hydrogen, cyano, a group of the formulae $COOR^4$ or $CONR_2^4$, wherein $R^4$ represents hydrogen, alkenyl, alkyl($C_1$–$C_{18}$), cycloalkyl, aryl, alkylaryl, halogenoaryl, aralkyl, alkoxyalkyl, halogenoalkyl, hydroxyalkyl, alkylaminoalkyl, carboxyalkyl, or carboalkoxyalkyl, or two alkyl groups bound to the carbonamide group may together also form a morpholine, piperidine or piperazine ring, or $R^3$ represents a group of the formula



in which $R^5$ represents straight-chain or branched alkyl groups having 1 to 6 carbon atoms, which may be substituted by halogen atoms, dialkylamino, aryloxy, alkylmercapto or arylmercapto groups or aryl radicals, a phenyl, alkylphenyl or alkoxyalkyl group, a group of the formula $-(CH_2CH_2O)_n-R$, wherein R equals lower alkyl and n is 2 or 3, a dialkylaminoalkoxyalkyl or alkylthioalkoxyalkyl group or those dialkylaminoalkoxyalkyl groups in which the two alkyl groups may together form a piperidine, pyrrolidine, hexamethylene-imine, morpholine or piperazine ring, and from 1 to 0.05 part by weight of a compound of the general formula



in which $A_1$ and $A_2$ represent, independently of each other, unsubstituted or non-chromophoric substituted ring systems fused to the azole ring of benzene, naphthalene or tetrahydronaphthalene,

R represents halogen, alkyl of 1 to 12 carbon atoms, alkoxy of 1 to 18 carbon atoms, alkenyl of 3 or 4 carbon atoms, cyano, cycloalkyl, phenylalkyl of 1 to 4 carbon atoms in the alkyl moiety, aralkoxy of 1 to 4 carbon atoms in the alkoxy moiety, phenyl, phenoxy, arylsulfonyl, alkylsulfonyl of 1 to 8 carbon atoms, $-SO_2NY_1Y_2$, wherein $Y_1$ and $Y_2$ — independently of each other — stand for hydrogen or optionally substituted alkyl of 1 to 8 carbon atoms, or $Y_1$ and $Y_2$ — together with the nitrogen atom to which they are bound — form a heterocyclic ring which may optionally show further hetero atoms in the ring and which may optionally be substituted, $SO_3M$, in which M stands for hydrogen or a salt-forming cation, or —COOY, wherein Y stands for hydrogen, a salt-forming cation, alkyl of 1 to 8 carbon atoms, or together with $R_1$ makes up a fused benzene ring,

$R_1$ represents hydrogen, halogen, alkyl of 1 to 12 carbon atoms, alkoxy of 1 to 18 carbon atoms, alkenyl of 3 or 4 carbon atoms or aralkoxy of 1 to 4 carbon atoms in the alkoxy moiety, or together with R makes up a fused benzene ring,

$R_2$ represents hydrogen, halogen or alkyl of 1 to 12 carbon atoms,

$R_3$ represents hydrogen or halogen, and

X represents oxygen or =N—Z, wherein Z stands for hydrogen, alkyl of 1 to 4 carbon atoms, which may be unsubstituted or substituted by hydroxy or cyano, alkenyl of 3 or 4 carbon atoms, aralkyl of 1 to 4 carbon atoms in the alkyl moiety, or alkanoyl of 2 to 5 carbon atoms.

---

## 4,129,413
## OXIDATION HAIR DYES BASED UPON TETRAAMINOPYRIMIDINE DEVELOPERS AND MONO- AND DIALKYL -M- DIHYDROXY BENZENE COUPLERS

**David Rose, Hilden; Erwin Weinrich, Haan, and Edgar Lieske, Dusseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Dusseldorf, Fed. Rep. of Germany**

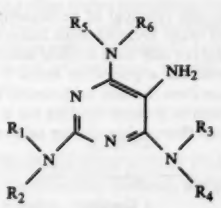
**Filed Apr. 14, 1977, Ser. No. 787,465**

**Claims priority, application Fed. Rep. of Germany, Apr. 23, 1976, 2617739**

**Int. Cl.[2] A61K *7/13*; D06P *1/32***

**U.S. Cl. 8—10.2** **16 Claims**

1. A composition of the developer-coupler type for the dyeing of hair, consisting essentially of, as developer, (A) a tetraaminopyrimidine of the formula



wherein $R_1$, $R_2$, $R_3$, $R_4$, $R_5$ and $R_6$ are each selected from the group consisting of hydrogen, phenyl, alkyl having 1 to 4 carbon atoms, phenylalkyl having 7 to 10 carbon atoms, phenylalkenyl having 7 to 10 carbon atoms,

$X-(CH_2)_n-$

wherein n is an integer from 1 to 4, and X is selected from the group consisting of hydroxyl, halogen and $NR_7R_8$— in which $R_7$ and $R_8$ are each hydrogen or alkyl having 1 to 4 carbon atoms, and together with the nitrogen atom $R_7$ and $R_8$ form a member selected from the group consisting of a 5 to 6 membered heterocyclic ring optionally containing an additional nitrogen atom or oxygen atom, and wherein $R_1$ and $R_2$, or $R_3$ and $R_4$, or $R_5$ and $R_6$, together with the nitrogen atom form a five to six membered heterocyclic ring optionally containing another nitrogen or oxygen atom in the ring, or (B) a water-soluble acid addition salt of (A), or a mixture of said tet-

raaminopyrimidines, and, as coupler, a mono- and/or di-alkyl-m-dihydroxybenzene, wherein the alkyl radical has 1–4 carbon atoms, or a mixture of said m-dihydroxybenzenes, said developer and said coupler being present in the molar range of about 2:1 to 1:2.

---

**4,129,414**

## OXIDATION HAIR COLORANTS CONTAINING WATER-SOLUBLE POLYHALOGEN 3-AMINOPHENOLS AS COUPLERS

**David Rose, Hilden; Ferdi Saygin, Erkrath, and Edgar Lieske, Dusseldorf, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Dusseldorf-Holthausen, Germany**

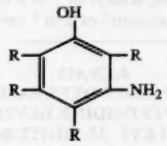
**Filed Feb. 26, 1976, Ser. No. 661,548**

**Claims priority, application Fed. Rep. of Germany, Mar. 3, 1975, 2509096**

**Int. Cl.[2] A61K *7/13***

**U.S. Cl. 8—10.2** **21 Claims**

1. An oxidizable developer-coupler combination for use in the dyeing of hair, comprising a water-soluble polyhalogen 3-aminophenol of the formula:




wherein two or three of the R's are halogen and the other R or R's are hydrogen, as the coupler, and a developer therefor.

---

**4,129,415**

## METHOD FOR REMOVING PERMANENT DYES FROM HAIR AND OTHER KERATINACEOUS MATERIALS

**Morton A. Westman, Fort Lee, N.J., assignor to American Cyanamid Company, Stamford, Conn.**

**Continuation of Ser. No. 732,618, Oct. 15, 1976, abandoned. This application Jan. 18, 1978, Ser. No. 870,303**

**Int. Cl.[2] D06L *3/00***

**U.S. Cl. 8—102** **4 Claims**

1. A method for the removal of permanent oxidation-type dyes from hair and other keratinaceous materials which comprises treating said dyed hair with a dilute solution of dichloro-s-triazine-2,4,6-trione for a period of about 5 to 20 minutes; rinsing said solution from the hair with water; treating the hair with a dilute solution of sodium bisulfite for a period of about 5 to 20 minutes; and thoroughly rinsing said treated hair with water.

---

**4,129,416**

## PROCESS FOR SHRINKING NYLON FABRICS

**Roxanne L. Bennett, Mountville, and James A. Tshudy, Ephrata, both of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.**

**Filed Jun. 28, 1977, Ser. No. 810,852**

**Int. Cl.[2] B05D *5/00*; D06M *3/16***

**U.S. Cl. 8—115** **15 Claims**

1. A method for longitudinally contracting fibers of nylon in textile fabrics comprising the steps of:

(a) applying to defined areas of said textile fabric a nylon textile fabric contracting agent comprising

(1) ammonium nitrate or a metal nitrate,

(2) an inorganic acid, an organic carboxylic acid, an organic sulfonic acid, an anhydride of said acids or mixtures thereof, and

(3) a halo, $C_6$ to $C_{14}$ carboxylic aryloxy or $C_1$ to $C_4$ linear or branched alkoxy substituted $C_1$ to $C_4$ linear or branched aliphatic alcohol or mixtures thereof;

(b) heating said fabric of step (a) to a temperature of from about 200° F. to about 400° F. for a period sufficient to initiate said longitudinal contraction of said fibers of nylon in said textile fabric;

(c) removing substantially all of the contracting agent from said textile fabric, thereby resulting in a wet textile fabric; and,

(d) drying the textile fabric of step (c), thereby further longitudinally contracting said fibers of nylon in said textile fabric.

---

**4,129,417**

## MULTISYSTEM TEST MEANS

**William I. White, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.**

**Filed Oct. 28, 1977, Ser. No. 846,441**

**Int. Cl.[2] G01N *33/16***

**U.S. Cl. 23—230 B** **34 Claims**

1. A multisystem test composition effective for the determination of a sample constituent in a single operation comprising:

at least one component reactive upon a single contact to chemically alter said sample constituent under reaction conditions incompatible with production of a detectable response, and

at least one additional component effective upon said single contact with said sample to change reaction conditions after a time sufficient for reaction of said first component with said sample constituent from those incompatible with the production of a detectable response to those compatible with such a detectable response.

26. A method for determination of a constituent in a sample requiring reaction systems which are effective under different reaction conditions which method comprises contacting the sample with the composition of claim 1 and observing any detectable reaction.

---

**4,129,418**

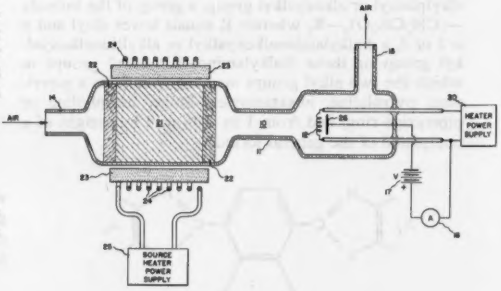
## DISCRIMINATING HALOGEN SENSOR

**William D. Davis, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Feb. 21, 1978, Ser. No. 879,157**

**Int. Cl.[2] G01N *27/62***

**U.S. Cl. 422—98** **9 Claims**




1. A discriminating halogen detector comprising:

an envelope with an air inlet and an air outlet at substantially opposite ends thereof, said envelope enclosing a source region and an electrode region, said source region being proximal to the air inlet and said electrode region being proximal to the air outlet, said source region internally communicating with said electrode region;

an alkali metal compound source contained in said source region;

means to independently heat said source region;

a heated anode disposed in said electrode region capable of

ionizing alkali vapors generated by said alkali metal compound source; and

a cathode disposed in said electrode region adjacent to but not contacting said anode, whereby ions generated at the heated anode migrate to said cathode thereby forming a detectable current in an external circuit in response to halogens contained in air passing through the source region of the detector.

---

## 4,129,419

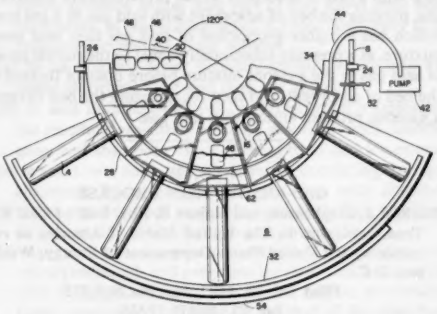
## DISPOSABLE LABORATORY DEVICE FOR TRANSFER OF FLUIDS TO A CENTRIFUGAL ANALYZER HEAD

**William J. Hermann, Jr., Houston, Tex., assignor to Jocelyn Dickson, Potomac, Md., a part interest**

**Continuation-in-part of Ser. No. 734,950, Oct. 22, 1976, Pat. No. 4,086,060. This application Apr. 14, 1978, Ser. No. 896,548**

**Int. Cl.[2] G01N *1/14***

**U.S. Cl. 422—64** **16 Claims**




1. A disposable laboratory device for transferring fluids from at least one primary container to an associated well in a centrifugal analyzer head, comprising:

(A) an arcuately extending enclosure defining at least one radially disposed compartment therein, wherein said compartment is adapted to maintain fluid therein separate from any adjacent compartments, said enclosure having a first radially outermost surface adapted to receive an open end of a radially disposed primary container for flow communication into an associated compartment within said enclosure, and;

(B) a second surface on said enclosure, said second surface including an outlet means operable for a selective outlet flow communication from each compartment to an associated well in a centrifugal analyzer head when said second surface is positioned substantially horizontal and above a centrifugal analyzer head which is in a registration position, and;

(C) means for delivering a selectively controlled volume of pressurized gas to said at least one compartments, whereby said pressurized gas is operable to transfer a selective volume of fluid, which has flowed into any compartment from an associated primary container, from said any compartment into a well which is in registration with the outlet means of said compartment, wherein said outlet means further includes fluid valve means operable to close said outlet flow communication when all of the fluid within a given compartment has been so transferred to the well in registration therewith.

## 4,129,420

## PROCESS FOR MAKING COKE FROM CELLULOSIC MATERIALS AND FUELS PRODUCED THEREFROM

**Edward Koppelman, 4424 Bergamo Dr., Encino, Calif. 91316**

**Continuation-in-part of Ser. No. 648,170, Jan. 12, 1976, Pat. No. 4,052,168. This application Sep. 7, 1977, Ser. No. 831,343**

**The portion of the term of this patent subsequent to Oct. 4, 1994, has been disclaimed.**

**Int. Cl.[2] C10L *1/32, 9/08;* C10B *51/00***

**U.S. Cl. 44—51** **12 Claims**

1. A process for converting cellulosic feed materials into a useful solid fuel which comprises the steps of charging the cellulosic feed material into an autoclave, heating said feed material to an elevated temperature of at least about 750° F. up to about 1250° F. and pressure of at least about 1000 psi for a period of time to convert the moisture and at least a portion of the volatile organic constituents therein into a gaseous phase and to effect a partial thermal restructuring of the chemical structure thereof and a change in its chemical composition to produce a solid reaction product, and thereafter cooling said reaction product and recovering the upgraded solid coke product.

11. A liquid fuel comprising a mixture of a residual fuel oil and a wood coke particulate solid fuel produced in accordance with the process as defined in claim 1, said wood coke solid fuel present in an amount of from about 1% up to about 50% by weight of the fuel slurry, said wood coke being present in the form of suspended particles substantially uniformly distributed and having an average particle size of less than about 48 mesh.

---

## 4,129,421

## CATALYTIC FUEL ADDITIVE FOR JET, GASOLINE, DIESEL, AND BUNKER FUELS

**Harry M. Webb, Toronto, Canada, assignor to Natural Resources Guardianship International, Inc., Clayville, N.Y.**

**Continuation-in-part of Ser. No. 783,777, Apr. 1, 1977. This application Jun. 24, 1977, Ser. No. 809,864**

**The portion of the term of this patent subsequent to Jul. 11, 1995, has been disclaimed.**

**Int. Cl.[2] C10L *1/22***

**U.S. Cl. 44—56** **9 Claims**

1. A fuel additive for jet, internal combustion, and diesel engines consisting of an active ingredient formulation comprising a mixture of picric acid and ferrous sulfate in a relationship of picric acid:ferrous sulfate of about 17:1 to 70:1 in a combination alcohol solvent of methanol, ethanol, isopropanol, and toluene and water.

---

## 4,129,422

## COAL GASIFICATION PLANT

**Andrew Wood, Dunfermline, Scotland, assignor to British Gas Corporation, London, England**

**Filed Feb. 23, 1977, Ser. No. 771,330**

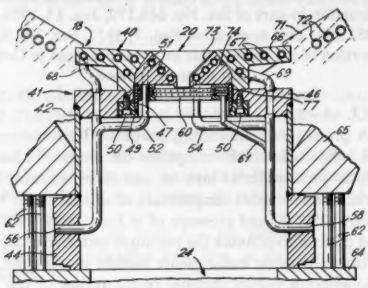
**Claims priority, application United Kingdom, Mar. 22, 1976, 11445/76**

**Int. Cl.[2] B01J *3/00***

**U.S. Cl. 48—62 R** **7 Claims**

1. In a coal slagging gasifier comprising: a gasifying vessel; means for introducing coal into said vessel for gasification thereof in said vessel; means for introducing oxygen and steam into said vessel to effect gasification of coal therein; and a hearth located at the bottom of said vessel and including a slag tap orifice located centrally within said hearth for removing slag from the vessel; the improvement wherein said hearth further includes means for defining a removable annular hearth member located so as to fit over and around said slag tap orifice and comprising a solid mass of high thermal conductivity material having means defining an integrally formed passageway for circulating a coolant liquid at a pre-determined rate of flow through said mass, and means defining an inlet and

outlet communicating said passageway exteriorly of the mass, whereby in operation of the gasifier the exposed surfaces of the



mass in direct contact with the molten slag are maintainable at a temperature within the range 200° C. to 400° C.

---

**4,129,423**

## STABLE LIQUID ABRASIVE COMPOSITION SUITABLE FOR REMOVING MANGANESE-ION DERIVED DISCOLORATIONS FROM HARD SURFACES

**Fred K. Rubin, Leonia, N.J., assignor to Lever Brothers Company, New York, N.Y.**

**Continuation-in-part of Ser. No. 679,521, Apr. 23, 1976, Pat. No. 4,049,467. This application Apr. 22, 1977, Ser. No. 790,124**

**The portion of the term of this patent subsequent to Sep. 20, 1994, has been disclaimed.**

**Int. Cl.[2] B08B *3/08***

**U.S. Cl. 51—304** **5 Claims**

1. A pourable liquid, abrasive, stain removing composition, comprising:

(A) a solid phase, comprising about 5 to about 65 percent, by weight of said composition, of a substantially water insoluble, abrasive material selected from the group consisting of calcite, dolomite, feldspar, silica flour, quartz, pumice, polishing clays and mixtures thereof, dispersed and suspended in;

(b) a stabilizing aqueous liquid phase, comprising

(i) about 1 to about 20 percent of a tertiary surfactant mixture, said mixture consisting essentially of:

(a) about 0.25 to about 10 percent, by weight of said composition, of an alkylaryl sulphonate synthetic anionic surfactant;

(b) about 0.25 to about 10 percent, by weight of said composition, of a soap wherein said soap is an alkali metal salt of a ten to twenty-two carbon fatty acid; and

(c) about 0.50 to about 10 percent by weight of said composition, of a fatty acid alkanolamide, nonionic surfactant wherein the fatty acid moiety of said amide contains about 8 to about 18 carbon atoms;

wherein the ratio of said soap to said synthetic anionic in said mixture is about 1:3.2 to about 1:0.8, and wherein the ratio of said synthetic anionic surfactant plus said soap to said nonionic surfactant is about 0.6:1 to about 1:0.9; and

(ii) about 3 to about 20 percent of an electrolyte system comprising at least one electrolyte selected from the group consisting of dihydroxymaleic acid, of an alkali metal salt of dihydroxymaleic acid, dihydroxytartaric acid, an alkali metal salt of tartaric acid, and mixtures thereof.

**4,129,424**

## GAS SEPARATION

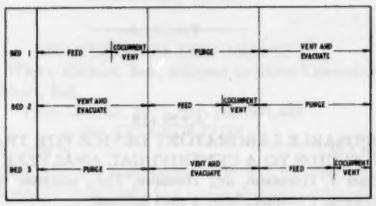
**John W. Armond, Great Bookham, England, assignor to BOC Limited, London, England**

**Filed May 5, 1977, Ser. No. 794,141**

**Claims priority, application United Kingdom, May 7, 1976, 18926/76**

**Int. Cl.[2] B01D *53/00***

**U.S. Cl. 55—25** **8 Claims**




1. A method for increasing the proportion of a gas in a gaseous mixture of which it is a constituent, which method consists essentially of sequentially contacting the gaseous mixture with a bed of adsorbent which preferentiallly adsorbs said gas, purging the bed of adsorbent with said gas or a gas stream, which has a higher proportion of said gas than said gaseous mixture, at a pressure substantially equal to the partial pressure of said gas in the gaseous mixture before contact thereof with the bed of adsorbent, and then regenerating the bed to recover a gaseous product enriched in said gas.

---

**4,129,425**

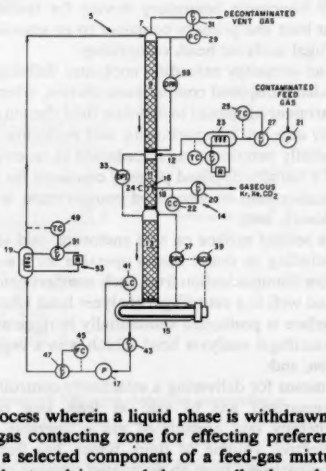
## GAS-ABSORPTION PROCESS

**Michael J. Stephenson, and Robert S. Eby, both of Oak Ridge, Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Jul. 18, 1977, Ser. No. 816,575**

**Int. Cl.[2] B01D *53/16***

**U.S. Cl. 55—44** **10 Claims**




1. In a process wherein a liquid phase is withdrawn from a first liquid-gas contacting zone for effecting preferential absorption of a selected component of a feed-gas mixture in a liquid absorbent and is passed downwardly through second and third liquid-gas contacting zones, the liquid-phase input to the second zone comprising said liquid containing absorbent in solution said gaseous component and at least one less-soluble, diluent gas, said liquid-phase input being contacted in the second zone with a warmer, upflowing gas phase derived from the third zone, said gas phase comprising vapor of said liquid

absorbent and a lesser amount of gas desorbed from said liquid absorbent; the method of recovering said component as a gas, comprising:

(a) establishing a peak concentration of said component in a section of the second zone by

(1) maintaining the temperature of the liquid-phase input to the second zone at a sufficiently lower value than the temperature of said upflowing third-zone-derived gas-phase input to the second zone to effect, in said section, condensation of a major fraction of the absorbent-vapor upflow into said section; and

(2) maintaining below said section stripping factors of less than one for said component and for gases less soluble than said component while maintaining above said section stripping factors of more than one for said component and less than one for less-soluble gases; and

(b) withdrawing gas rich in said component from said section.

6. A process for recovering a selected component from a feed-gas mixture containing the same, said process comprising:

(a) providing a liquid-gas contacting column defining an upper zone, an intermediate zone, and a lower zone;

(b) passing a stream of a liquid absorbent for said component downwardly through the zones of said column, said zones being maintained at approximately the same superatmospheric pressure and at least part of said lower zone being maintained at the boiling point for said absorbent at the pressure prevailing in said column;

(c) in said upper zone, countercurrently contacting said liquid absorbent with said feed gas mixture;

(d) in said intermediate zone, countercurrently contacting the resulting gas-enriched liquid absorbent with desorbed gases and absorbent vapor derived from said lower zone;

(e) in said lower zone, countercurrently contacting the liquid absorbent from the intermediate zone with absorbent vapor and desorbed gases obtained by boiling the liquid absorbent downflow through said lower zone;

(f) maintaining the temperatures and flow rates of the countercurrent liquid- and gas-phase inputs to said intermediate zone at values effecting, in a section of said intermediate zone, condensation of a major fraction of the absorbent-vapor upflow into said section, while maintaining below said section stripping factors of less than one for said components and for gases less suitable than said component and above said section stripping factors of more than one for said component and less than one for gases less soluble than said component, thus concentrating said component as in said section, and

(g) withdrawing gas enriched in said component from said section.

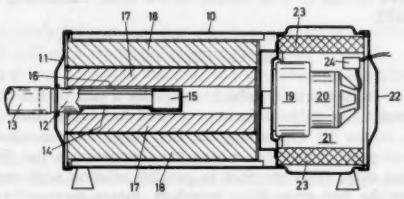
---

**4,129,426**

## DEVICE FOR CLEANING WORKSHOP AIR

**Willy Furåsen, Kungälv, Sweden, assignor to Flex Ake Wennberg AB, Karlstad, Sweden**

**Filed Jul. 29, 1977, Ser. No. 820,371**
**Claims priority, application Sweden, Aug. 10, 1976, 7608901**
**Int. Cl.² B01D *50/00***
**U.S. Cl. 55—217** **3 Claims**




1. A device for cleaning workshop air comprising:

(a) a casing having an inlet at one end thereof and an outlet at the other end thereof;

(b) means for separating and collecting large particles and arresting sparks located at the inlet end of the casing;

(c) a fan and an electric motor driving the same located at the outlet end of the casing;

(d) a mechanical filter located within said casing downstream of and communicating with said spark arresting means and upstream of said fan;

(e) filter means containing active carbon located at the outlet end of the casing downstream of said motor; and

(f) conduit means within said casing for directing air from said mechanical filter to said fan past said motor to said active carbon-containing filter means;

(g) whereby the air being filtered, after passing through said spark arresting means and said mechanical filter and said fan, is heated by passing over said motor before passing through said active carbon-containing filter means.

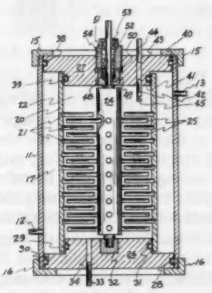
---

**4,129,427**

## APPARATUS FOR CONTACTING AN AEROSOL STREAM WITH A LIQUID

**James L. Harris, Westfield, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.**

**Filed Oct. 11, 1977, Ser. No. 840,864**
**Int. Cl.² B01D *47/02***
**U.S. Cl. 55—247** **13 Claims**



1. Apparatus for effecting removal of components from an aerosol stream by intimately contacting said stream with an agitated liquid medium which apparatus comprises:

(a) a vessel of substantially circular cross section having side walls and first and second end closures in sealing engagement with the side walls with at least one of said end closures being removable;

(b) a plurality of rod-like projections rigidly secured to and extending radially inwardly from the side walls of said vessel at predetermined locations;

(c) a rotatably supported shaft concentrically positioned within said vessel and provided with a plurality of finger-like appendages rigidly secured thereto and extending radially outwardly from predetermined locations on the sides of the shaft;

(d) support means for maintaining the position of said shaft in concentric relationship with respect to the axis of the vessel that is perpendicular to the circular cross section of the vessel and for restricting axial movement of said shaft so that the finger-like appendages intermesh with the rod-like projections in non-contacting relationship during rotation of said shaft;

(e) a liquid medium disposed in said vessel;

(f) inlet and outlet means for passing an aerosol stream through said vessel and for introducing the liquid medium into the vessel; and

(g) means for rotating said shaft at a rotational speed that is

effective for removing components from the aerosol stream.

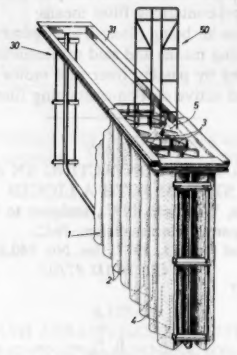
---

**4,129,428**

## COMPACT FILTER MOUNTED IN A CASSETTE FRAME

Rune S. Andersson, and Svante O. Berglund, both of Växjö, Sweden, assignors to Aktiebolgatet Svenska Flaktfabriken, Nacka, Sweden

Filed Aug. 29, 1977, Ser. No. 828,427
Claims priority, application Sweden, Aug. 31, 1976, 7609624
Int. Cl.[2] B01D *46/02*
U.S. Cl. 55—379 6 Claims



1. For use in a filter housing, at least one filter cassette, a bag-type filter element supported in said cassette, said filter element comprising a plurality of filter bags forming gas passageways which, at their lower ends are closed, and at their upper ends form a common gas opening, said element having collar means extending outwardly therefrom around said upper end to comprise means for fastening the filter element in the cassette, said cassette having a rectangular frame surrounding said upper end and underlying said collar means, said frame adapted to connect said opening with the filter housing and comprising four channel elements of U-shaped cross-section facing with the groove opening outwardly, two of said channel elements at the outer edges having lips directed toward each other and forming a gap therebetween of a width smaller than the width of the groove, said collar means extending about the periphery of the opening being folded over the upper sides of the channel elements and into the grooves thereof, and the collar means of the filter element being formed with sleeves for the sides associated with the said two channel elements provided with lips, two L-shaped locking rods having two legs of a thickness less than the width of the groove, each inserted with one leg in one of said sleeves to lockingly retain said sleeve in the respective channel element provided with lips, the other locking rod leg, with the collar wrapped partially around it, being lockingly pressed into the groove of the adjacent channel element in such a manner than an efficient detachable locking of the filter element to the cassette frame is obtained, said collar means forming a seal between the upper surface of the channel element and the filter housing.

---

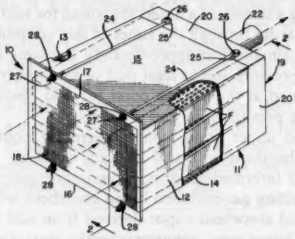
**4,129,429**

## DUAL ELEMENT AIR FILTER

Kingsley E. Humbert, Jr., Gastonia, N.C., and Lewis J. Judah, Meeker, Okla., assignors to Wix Corporation, Gastonia, N.C.

Filed Jun. 30, 1977, Ser. No. 811,594
Int. Cl.[2] B01D *46/02*
U.S. Cl. 55—484 8 Claims

1. An air filter, comprising: a frame having a pair of channel shaped side walls, each side wall having a web portion and a pair of flanges connected to said web portion, said flanges defining a frame top and a frame bottom, respectively, said top and bottom each having an air inlet opening defined therein and being spaced apart to define a thickness for said frame, said frame further including an imperforate front wall, and a frame back including an end wall having a plurality of air openings defined therein, said front wall and back being spaced apart to define a length for said frame, said air openings in said frame back end wall forming a filter outlet for passing filtered air out of the air filter, said side walls being spaced apart imperforate and extending from the front wall to the frame back at opposite sides of the frame; first and second pleated air filter elements mounted on said frame side wall defining channels, said first filter element being located at said frame top, and said second filter element being located at said frame bottom, extending, respectively, from the top of the front wall to the top of the frame back, and from the bottom of the front wall to the bottom of the frame back, said pleated elements each having a top surface and a bottom surface and a pair of sides with said side wall defining channels being located on the outside of said filter element sides, said pleated filter elements being separate from each other and spaced apart from one another along the entire length thereof and defining an outlet space therebetween



communicating with said filter outlet defined in said frame back end wall; perforate cover sheets mounted on each of said pleated element top and bottom surfaces, said perforate cover sheets defining air passages for the air filter for passing air to be filtered from said air inlet openings through said pleated elements and into said outlet space; and a plurality of reinforcing means in the filter between the pleated filter elements, said plurality of reinforcing means including a pair of side reinforcing means each located between said perforate cover sheets and near said filter element sides and said frame side wall defining channel webs and an intermediate reinforcing means located intermediate said filter element sides to support said filter elements near the middles thereof, and adhesive means securing said side reinforcing means to said frame side wall defining channel webs, said reinforcing means contacting the cover sheets of both said filter elements for supporting said filter elements in spaced relation and extending from said front wall to said frame back to contact both said filter elements for the entire length thereof to support said filter elements for the entire length and thickness of said frame thereby strengthening the entire frame sufficiently to enable the air filter to support the weight of a man thereon.

---

**4,129,430**

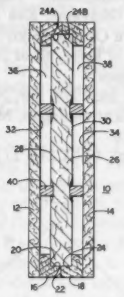
## FILTER ASSEMBLY

Charles L. Snow, 4900 Spring Grove Ave., Cincinnati, Ohio 45232

Filed Apr. 11, 1977, Ser. No. 786,341
Int. Cl.[2] B01D *46/00*
U.S. Cl. 55—485 1 Claim

1. A filter assembly which comprises a pair of flat fibrous dimensionally stable resin-impregnated first stage filter members, means for supporting the first stage filter members in spaced parallel relation, means for supporting a flat fibrous second stage filter member in parallel relation with and between the first stage filter members, means surrounding the second stage filter member and forming plenum chambers between the second stage filter member and the first stage

members, the means supporting the first stage filter members in spaced relation including a pair of ring members defining a frame, there being an inwardly directed groove in the frame an outer edge portion of the second stage filter member being mounted in the groove, edge portions of the first stage filter members bearing on the sides of the frame and a plurality of




spacer members between sides of the second stage filter member and opposed sides of the first stage filter members to hold the second stage filter member in spaced relation to the first stage filter members, the spacer members and the ring members holding the second stage filter member spaced from the first stage filter members.

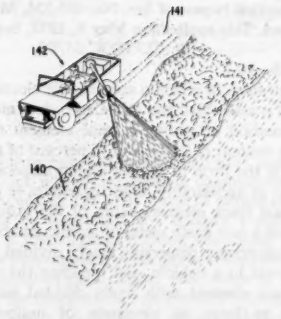
---

**4,129,431**

## CRYOTHERMAL MANIPULATION OF PETROLEUM

**Sigmund L. Ross, Bronx, N.Y., and Oscar Shuffman, deceased, late of Scarsdale, N.Y., assignors to Rose Shuffman, executrix u/w Oscar Shuffman, deceased, Scarsdale, N.Y.**

**Division of Ser. No. 246,960, Apr. 24, 1972, Pat. No. 4,031,707.**
**This application Jan. 26, 1977, Ser. No. 762,657**
**Int. Cl.² F25C *1/00***
**U.S. Cl. 62—66** **3 Claims**



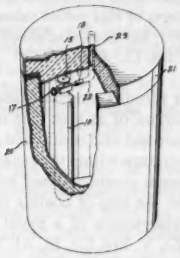

1. A method for recovering a body of petroleum constituting an oil spill on a sandy surface comprising the steps of:
providing a mass of material at a cryothermal temperature corresponding to the freezing point of water at sea level or lower, which cryothermal temperature is lower than the temperature of said body of petroleum;
spraying said mass of material onto said sandy surface so as to increase the surface tension of said body of petroleum thereby causing the latter to rise to the upper surface of said sandy surface; and
removing said body of petroleum from said sandy surface.

**4,129,432**

## EXPENDABLE REFRIGERATION SYSTEM

**David Garside, Rosemere, Canada, assignor to Garwall Cooling Limited, Montreal, Canada**

**Filed May 4, 1977, Ser. No. 793,646**
**Int. Cl.² F25D *3/10***
**U.S. Cl. 62—222** **8 Claims**



1. In combination with a refrigeration chamber having an insulated storage compartment,
a pressurized uninsulated liquid carbon dioxide storage reservoir within the storage compartment, said liquid storage reservoir having a gaseous space,
a vent from the gaseous space,
and a pressure relief valve in the vent adapted to maintain a substantially constant pressure within the liquid storage reservoir, such that the temperature of the liquid carbon dioxide within the storage reservoir is controlled and is below the desired temperature within the insulated storage compartment.

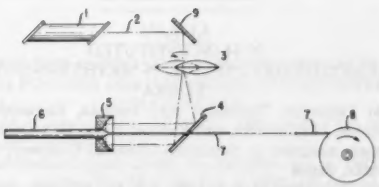
---

**4,129,433**

## FABRICATION OF AN OPTICAL FIBER WAVEGUIDE WITH PERIODIC VARIATIONS IN DIAMETER

**Raymond E. Jaeger, Basking Ridge, and Herman M. Presby, Highland Park, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Continuation of Ser. No. 732,344, Oct. 14, 1976, abandoned.**
**This application Apr. 12, 1978, Ser. No. 895,816**
**Int. Cl.² C03B *37/00***
**U.S. Cl. 65—2** **7 Claims**




1. A method of fabricating an optical fiber with periodic diameter variations along the length of the fiber comprising:
focusing light emitted from a laser onto the drawdown zone of an optical fiber preform;
heating the drawdown zone of the optical fiber preform to a molten state using the focused laser light;
pulsing the laser light;
feeding continuously the preform into the region of focused laser light;
the invention characterized in that the laser light is pulsed at a rate greater than 10Hz and an optical fiber is drawn from the molten region of the preform, with diameter variations of magnitude greater than 0.1 percent of the fiber diameter and of period over the fiber length of less than 10mm.

4,129,434

## PROCESS FOR FORMING A METAL OXIDE COATING

Emile Plumat, Gilly, and Robert Posset, Mont-sur-Marchienne, both of Belgium, assignors to Glaverbell, Watermael-Boitsfort, Belgium

Continuation of Ser. No. 269,400, Jul. 6, 1972, abandoned. This application Aug. 19, 1975, Ser. No. 605,815

Claims priority, application Luxembourg, Jul. 8, 1971, 63490

The portion of the term of this patent subsequent to Nov. 26, 1991, has been disclaimed.

Int. Cl.[2] C03C *17/00*

U.S. Cl. 65—60 D 9 Claims

1. In a process for forming a metal oxide coating on a substrate wherein a solution of at least one metal compound is applied to the substrate and said compound is converted in situ by heating to a temperature within the range of 300° C. to 700° C. to convert said metal compound and leave a coating of at least one metal oxide, the step of coating the substrate with a solution of an acetylacetonate of a metal selected from the group: Fe, Ni, Co, Zn, V, Mn, Cu, In, Al, Ti, Zr, Th, Cr, Mg, Bi, Y, W, Ce or a mixture of acetylacetonates of two or more metals of such group in a solvent, the improvement wherein the solvent is selected from the group consisting of ethylene diamine, propylene diamine, butylamine, propylamine, dimethylformamide, dimethylacetamide, tetramethylurea, dimethylsulfoxide, acetonitrile, nitrobenzene, ethylene carbonate, tetramethylenesulfone, hexamethylphosphoramide, or a mixture of two or more solvents selected from solvents of that group.

---

4,129,435

## AGRICULTURAL CHEMICAL/RESIN COMPOSITIONS

Tetsuo Takematsu, Utsunomiya; Fusayoshi Masuda, Kyoto; Kenji Tanaka, Ootsu; Kazuo Nishida, and Akira Nakamura, both of Kyoto, all of Japan, assignors to Sanyo Chemical Industries, Ltd., Kyoto, Japan

Filed Jul. 26, 1976, Ser. No. 708,714

Int. Cl.[2] A01N *7/00, 17/08*

U.S. Cl. 71—65 5 Claims

1. An agricultural chemical composition of improved efficiency, long range effectiveness and decreased phtotoxicity to desirable plants, which comprises:

a herbicidally effective amount of a herbicide and a film-forming polyurethane resin emulsion or organic solvent solution containing hydrophilic groups and having a soil fixity of at least 40% and a water vapor permeability of 400–1500 g/m$^2$/24 hrs.

---

4,129,436

## N'-[4-(SUBSTITUTED PHENETHYLOXY)PHENYL]-N-METHYL-N-METHOXYUREA

Ichiki Takemoto, Toyonaka; Ryo Yoshida, Kawanishi; Seizo Sumida, Nishinomiya, and Katsuzo Kamoshita, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

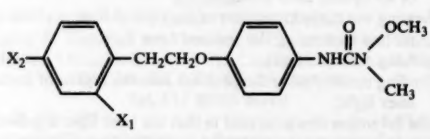
Filed Mar. 1, 1978, Ser. No. 882,383

Claims priority, application Japan, Mar. 3, 1977, 52-23443

Int. Cl.[2] A01N *9/20;* C07C *69/76*

U.S. Cl. 71—120 7 Claims

1. A compound of the formula




wherein $X_1$ is a hydrogen atom or a methyl group and $X_2$ is a $C_1$–$C_5$ alkyl or a $C_1$–$C_5$ alkoxy group.

5. A herbicidal composition which comprises as an active ingredient a herbicidally effective amount of the compound according to claim 1 and an inert carrier.

---

4,129,437

## IRON ORE PELLET HAVING A SPECIFIC SHAPE AND A METHOD OF MAKING THE SAME

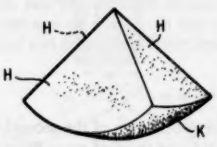
Kazumasa Taguchi, Amagasaki; Tsutomu Nishida, Kobe; Masaharu Kitajima, Okayama; Kan Aketa, Kakogawa; Isao Fujita, Kobe; Mamoru Onoda, Miki; Nobuyuki Imanishi, and Ryo Watanabe, both of Kobe, all of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed May 26, 1976, Ser. No. 690,289

Claims priority, application Japan, May 26, 1975, 50/63317; May 26, 1975, 50/63318

Int. Cl.[2] C21B *1/10*

U.S. Cl. 75—5 9 Claims




1. A fired and crushed iron ore pellet for use in the production of pig iron wherein:

the external form of said pellet comprises a combination of at least one spherically formed surface and at least one non-spherically formed surface; wherein

the average particle size of said iron ore pellet is in the range of from 5 to 25 mm; and

said iron ore pellet comprises iron ore and a slag component and has a compressive strength above 200 kg/pellet, a drum index about 95% above a particle size of 5 mm, and a swelling index below 14%.

---

4,129,438

## METHOD OF ADDING TRACE ELEMENTS TO BASE METALS

Howard B. Bomberger, Jr., Canfield, Ohio, assignor to RMI Company, Niles, Ohio

Continuation-in-part of Ser. No. 669,534, Mar. 23, 1976, abandoned. This application May 9, 1977, Ser. No. 795,340

Int. Cl.[2] C22C *15/00*

U.S. Cl. 75—10 C 7 Claims

1. In a process in which a consumable electrode of titanium base metal is assembled and said electrode is melted to form an ingot, a method of adding a trace element to said ingot to produce a content of 0.001 to 0.10 percent of trace element in the ingot in the form of minute highly dispersed particles not observable as undesirably large segregates in a lightly etched section, said trace element being of the group consisting of yttrium and a rare earth metal of atomic number 57 to 71, said method comprising dispersing finely divided particles of the trace element in a vehicle, and blending the vehicle and dispersed trace element with finely divided base metal of the electrode to form an electrode of uniform composition throughout before melting the electrode.

6. In a process in which a melt charge of titanium base metal is assembled and said charge is melted to form an ingot, a method of adding a trace element to said ingot to produce a content of 0.001 to 0.10 percent of trace element in the ingot in the form of minute highly dispersed particles not observable as undesirably large segregates in a lightly etched section, said trace element being of the group consisting of yttrium and a rare earth metal of atomic number 57 to 71, said method comprising dissolving particles of trace element in an acid solvent and a diluent as a vehicle, the diluent being water or alcohol, dispersing the solution of vehicle and trace element on finely

divided base metal or the constituents of the charge, and drying the charge before melting it.

---

**4,129,439**

## PROCESS FOR REFINING MOLTEN STEEL USING FERROALLOY

**Hajime Nashiwa, Sakai; Susumu Tsuzita, and Tsutomu Nagahata, both of Wakayama, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan**

**Continuation of Ser. No. 578,750, May 19, 1975, abandoned. This application Sep. 30, 1976, Ser. No. 727,998**

**Claims priority, application Japan, May 24, 1974, 49-58946**

**Int. Cl.[2] C21C *7/00*; C22C *28/00***

**U.S. Cl. 75—58** **5 Claims**

1. In a process for the manufacture of steel composed of 0.12 to 0.20% C, 0.20 to 0.50% Si, 1.20 to 1.60% Mn, 0.02 to 0.05% Al and the remainder Fe, the improvement in which a ferroalloy consisting essentially of 13 to 16% Si, 55 to 63 Mn, 4 to 6% Al, and the remainder of Fe with inevitable amounts of impurities, is added to molten steel containing 0.03 to 0.12% C, 0.10 to 0.25% Mn and the balance of Fe, in an amount of 17 to 22 kg of said ferroalloy per ton of said molten steel so as to deoxidize increase the yield and homogeneity of aluminium addition and said steel and adjust the composition thereof.

---

**4,129,440**

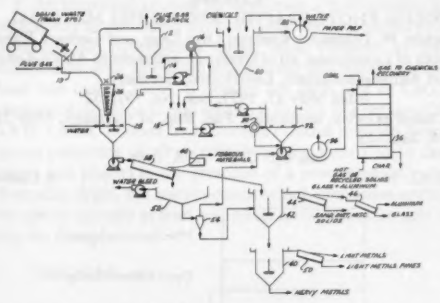
## PROCESS FOR DISPOSAL OF SOLID WASTES

**Donald E. Garrett, Claremont, Calif., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.**

**Continuation of Ser. No. 551,452, Feb. 19, 1975, abandoned, which is a continuation of Ser. No. 371,042, Jun. 22, 1973, abandoned, which is a continuation of Ser. No. 113,115, Jul. 8, 1970, abandoned. This application Jan. 17, 1977, Ser. No. 759,749**

**Int. Cl.[2] C22B *7/00*; C10B *53/08***

**U.S. Cl. 75—63** **32 Claims**



1. A process for recovery of values from solid wastes which contain paper stock which comprises in combination:

(a) initially expanding the solid waste to permit elutriation;

(b) classifying by elutriation the initially expanded solid waste into a first organic fraction containing the paper stock and a predominately inorganic-metals fraction containing residual organic waste, elutriation of the paper stock from the inorganic-metals fraction containing residual organic waste occurring by an upward flow of a gas stream through the initially expanded solid waste;

(c) collecting the first organic fraction;

(d) pulping the first organic fraction, and separating paper pulp to leave a first organic residue;

(e) further comminuting the predominately inorganic-metals fraction containing the residual organic waste and separating the residual organic waste therefrom by elutriation by an upward flow of water through the further comminuted inorganic-metals fraction to form a second organic residue;

(f) pyrolyzing the first and at least a portion of the second organic residues under nonoxidizing conditions to form char and a gaseous stream containing condensible hydrocarbons and gases; and

(g) processing the inorganic-metals fraction to recover values contained therein.

---

**4,129,441**

## RECOVERY OF SILVER FROM SILVER CONTAINING SOLUTIONS

**Wasyl Kunda, Edmonton, and Roderick H. Hitesman, Fort Saskatchewan, both of Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Canada**

**Filed Feb. 7, 1977, Ser. No. 766,108**

**Claims priority, application Canada, Sep. 29, 1976, 262288**

**Int. Cl.[2] C22B *11/00***

**U.S. Cl. 75—118 R** **22 Claims**

1. A process for the recovery of silver from an aqueous sulphate solution containing dissolved silver and at least one other dissolved metal selected from the group consisting of copper, nickel and cobalt, including treating said solution at a temperature between about 60° C. and about 125° C. with hydrogen gas at a partial pressure between about 2 and about 5 kg/cm$^2$ to precipitate the dissolved silver without precipitating any significant quantity of said at least one other dissolved metal.

---

**4,129,442**

## WEAR- AND IMPACT-RESISTING CAST STEEL

**Kaoru Horiuchi, Toride; Akio Matsui, Chiba; Masahiro Hara, Sakura, and Hiroshi Takahashi, Funabashi, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan**

**Continuation-in-part of Ser. No. 756,629, Jan. 4, 1977, abandoned. This application Apr. 14, 1977, Ser. No. 787,492**

**Claims priority, application Japan, Jan. 14, 1976, 51-3331**

**Int. Cl.[2] C22C *38/28***

**U.S. Cl. 75—126 C** **1 Claim**

1. A wear- and impact-resisting cast steel characterized by a hardness of Rockwell C 50 or higher and an impact value of 4 kg-m/cm$^2$ or higher, said cast steel consisting essentially of from 0.20 to 0.35% by weight of carbon, from 1.30 to 2.80% by weight of silicon, from 0.50 to 1.50% by weight of manganese, from 3.00 to 4.50% by weight of chromium, from 0.10 to 0.50% by weight of molybdenum, at least one element selected from the group consisting of titanium and zirconium, the sum of said at least one element being between 0.03 and 0.10% by weight, and the balance essentially iron.

---

**4,129,443**

## METHOD FOR IMPROVING THE SINTERABILITY OF IRON POWDER DERIVED FROM COMMINUTED SCRAP METAL

**Sydney M. Kaufman, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.**

**Continuation-in-part of Ser. No. 584,563, Jun. 6, 1975, abandoned, and Ser. No. 584,564, Jun. 6, 1975, abandoned, and Ser. No. 637,350, Dec. 3, 1975, abandoned. This application Oct. 26, 1976, Ser. No. 735,468**

**Int. Cl.[2] B22F *1/02*; B02C *11/08***

**U.S. Cl. 75—212** **58 Claims**

1. A method of making sintered shapes from ferrous-based metallic particles containing maganese and silicon, the latter having been cryogenically comminuted, the steps comprising:

(a) repeatedly impacting a charge of said metallic particles with a plurality of elements laden with copper or iron, each of said elements having a transverse dimension at least 50 times the longest dimension of any of said particles, said impacting being continued to simultaneously coat substantially each of said particles with a thin copper or iron envelope and to cold-work each of said particles having a size above 120–124 microns,

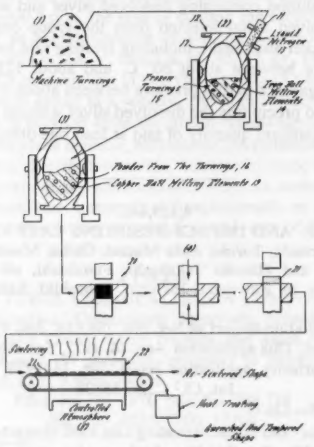
(b) compacting a predetermined quantity of said impacted particles into a desired shape, and

(c) heating said shape in an endothermic gas atmosphere to at least the sintering temperature for said metal particles to permit atomic diffusion to take place between particles in adjacent contact within said shape, said copper or iron envelope above each of said particles prohibiting oxidation of the ingredients of said particles during said heating, and said cold-working promoting increased diffusion.

9. A method of making an intermediate powder, comprising:

(a) selecting metallic turnings having oxidizable ingredients and which have a surface-to-volume ratio of at least 60:1,

(b) simultaneously refrigerate to below the ductile-brittle transition temperature of said turnings and impacting said turnings with a fracturing force, continuing said refrigeration and impaction for a period of time to comminute said turnings,




(c) impacting said comminuted particles at ambient temperature conditions with an abrading force, said impacting being carried out by the use of elements laden with a protective metal protective against oxidation of ingredients soluble in the base metal of said turnings and having a hardness less than that of the coated powder to promote transfer of said protective metal to said particles upon impact between said elements and particles, said protective metal having a melting temperature below but substantially near the liquidus of said particles and being completely soluble in said metal of said particles, said protective metal being relatively easy to abrade, and

(d) continuing to carry out the impaction of step (c) to provide both coating of said particles with a thin envelope of said protective metal and cold working of substantially each particle having a size greater than 124 microns to thereby promote at least one cold-work strain site therein.

---

**4,129,444**

## POWER METALLURGY COMPACTS AND PRODUCTS OF HIGH PERFORMANCE ALLOYS

**Dennis G. Dreyer, Kokomo; Edward M. Foley, Russiaville, and Herbert E. Rogers, Jr., Sharpsville, all of Ind., assignors to Cabot Corporation, Kokomo, Ind.**

**Continuation of Ser. No. 688,013, May 19, 1976, Pat. No. 4,062,678, which is a division of Ser. No. 443,091, Jan. 17, 1974, Pat. No. 3,945,621, which is a continuation-in-part of Ser. No. 323,502, Jan. 15, 1973, Pat. No. 3,846,126. This application Aug. 22, 1977, Ser. No. 826,362**

**Int. Cl.² B22F *1/00***

**U.S. Cl. 75—251** **6 Claims**

1. A powder metallurgy intermediate particulate product consisting essentially of a finely divided, crushed, pre-consolidated mixture of alloy metal powder, and finely divided organic binder in an amount less than 5% by weight of said alloy powder said crushed mixture providing a substantial fraction of −100 mesh particles at least about half of which are −325 mesh.

---

**4,129,445**

## METAL IMAGE FORMATION PROCESS

**Masato Fujiwara; Keiji Takeda, and Masayoshi Tsuboi, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan**

**Continuation of Ser. No. 731,957, Oct. 13, 1976, abandoned. This application Feb. 28, 1978, Ser. No. 881,945**

**Claims priority, application Japan, Oct. 13, 1975, 50-123107**

**Int. Cl.² G03C *5/54, 5/24***

**U.S. Cl. 96—29 R** **9 Claims**

1. A process for forming metal images which comprises:

imagewise inactivating an image receiving element containing physical development nuclei to intensification with a physical developer containing a salt of a reducible metal and a reducing agent by imagewise depositing silver on said physical development nuclei by diffusion transfer of silver ion from the unexposed portion of an imagewise exposed silver halide photographic element, said image receiving element comprising a support having vacuum deposited thereon or vacuum deposited on a layer on said support, nuclei for physical development selected from the group consisting of $GeS_2$, $SnS_2$, CdS and a combination of $GeS_2$ and gold, said silver ions being transferred in an effective amount to imagewise inactivating said nuclei for physical development;

and subsequently depositing said metal on said nuclei not depposited with said silver by contacting said image receiving element with said physical developer.

---

**4,129,446**

## COLOR PHOTOGRAPHIC RECORDING MATERIAL

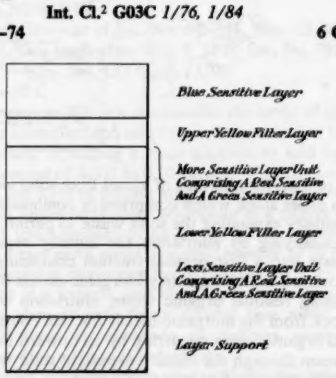
**Joachim W. Lohmann, Kuerten; Otto Lapp, and Gerhard Kuhn, both of Leverkusen, all of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany**

**Filed May 17, 1977, Ser. No. 797,752**

**Claims priority, application Fed. Rep. of Germany, May 21, 1976, 2622922**

**Int. Cl.² G03C *1/76, 1/84***

**U.S. Cl. 96—74** **6 Claims**


Blue Sensitive Layer
Upper Yellow Filter Layer
More Sensitive Layer Unit Comprising A Red Sensitive And A Green Sensitive Layer
Lower Yellow Filter Layer
Less Sensitive Layer Unit Comprising A Red Sensitive And A Green Sensitive Layer
Layer Support

1. The color photographic recording material consisting of

(a) a layer support having applied to it a plurality of light-sensitive and non-light-sensitive layers including

(b) at least two red sensitive silver halide emulsion layers of different speed each having associated with it a non-diffusing cyan-forming coupler, at least two green sensitive silver halide emulsion layers of different speed each having associated with it a non-diffusing magenta-forming coupler, and one or more blue sensitive silver halide emul-

sion layers each of said one or more blue sensitive layers having associated with it a non-diffusing yellow-forming coupler, and being located further removed from the layer support than anyone of said red sensitive and green sensitive layers, and

(c) at least one non-light-sensitive yellow filter layer located closer to the layer support than any of said one or more blue sensitive layers,

the more sensitive of said red sensitive layers and the more sensitive of said green sensitive layers being combined to form a comparatively more sensitive emulsion layer unit which is located further removed from the layer support than the less sensitive of said red sensitive layers and the less sensitive of said green sensitive layers being combined to form a comparatively less sensitive emulsion layer unit

wherein the improvement comprises a yellow filter layer is located between said more sensitive emulsion layer unit and said less sensitive emulsion layer unit

and said yellow filter being more adjacent to the layer support than said comparatively more sensitive emulsion layer unit, and

said yellow filter is not adjacent to a blue sensitive layer.

---

**4,129,447**

## PROCESS FOR THE PREPARATION OF HYDROPHOBIC AGENTS

**Michael Roth, and Konrad Gogolok, both of Burghausen, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany**

**Filed Feb. 7, 1977, Ser. No. 766,110**

**Claims priority, application Fed. Rep. of Germany, Feb. 17, 1976, 2606273**

**Int. Cl.² C09D *5/20***

**U.S. Cl. 106—2** **5 Claims**

1. An improved process for preparing a hydrophobic agent which may be combined with inorganic binding agents prior to molding, said hydrophobic agent being obtained by slaking caustic lime with an organopolysiloxane and water in which at least one mol of water is present for each mol of CaO, the organopolysiloxane in said emulsion having an average of from 0.8 to 1.8 SiC-bonded hydrocarbon radicals selected from the group consisting of alkyl radicals having from 1 to 16 carbon atoms and phenyl in the presence of a protective colloid and thereafter dried, the improvement which comprises adding to the above mixture at least one alkali metal salt of an acid having the formula:

$$R(O)_a SO_3H$$

in which R is a monovalent hydrocarbon radical having up to 50 carbon atoms and which may also contain oxygen and nitrogen atoms and a is 0 or 1.

---

**4,129,448**

## FORMALDEHYDE STABILIZED COATING COMPOSITIONS

**Stanley A. Greenfield, Ambler, and John A. Dupont, Glenside, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.**

**Continuation-in-part of Ser. No. 389,745, Aug. 20, 1973, abandoned. This application Sep. 6, 1977, Ser. No. 830,716**

**Int. Cl.² C09D *5/14***

**U.S. Cl. 106—15 R** **21 Claims**

1. In a coating composition which comprises a film-forming material, carrier, and a 3-isothiazolone, the improvement wherein the composition further comprises a stabilizing amount of formaldehyde.

**4,129,449**

## SOIL-HARDENING COMPOSITION

**Shokichi Kojima, Yamazaki Danchia 6-9-208, No. 2130, Yamazaki-Cho, Machida City, Tokyo, Japan**

**Filed Jul. 27, 1977, Ser. No. 819,238**

**Claims priority, application Japan, Jul. 29, 1976, 51-89681**

**Int. Cl.² C04B *7/355***

**U.S. Cl. 106—95** **4 Claims**

1. A composition to be added to soil to harden said soil consists essentially of Portland cement which has incorporated therein 2.0 to 0.8% by weight of lignin sulfonate having a molecular weight of 400 to 700,000, 0.4 to 0.5% by weight of sodium tripolyphosphate, 0.2 to 0.3% by weight of calcium stearate, 1.5 to 2.0% by weight of calcium chloride and 0.5 to 1.0% by weight of a slag silica.

---

**4,129,450**

## ACETYLENE VESSEL FILLER COMPOSITION

**Edith M. Flanigen, White Plains; Brent M. Lok, Spring Valley, and Norbert K. Mumbach, East Concord, all of N.Y., assignors to Union Carbide Corporation, New York, N.Y.**

**Filed Nov. 9, 1977, Ser. No. 849,896**

**Int. Cl.² C04B *7/34***

**U.S. Cl. 106—120** **12 Claims**

1. An aqueous slurry composition which is curable at saturated steam pressure and temperature of 360° to 400° F. to form a hard porous mass suitable for containing dissolved acetylene gas solutions, comprising lime, crystalline silica, and a thickening agent selected from the group consisting of (a) polyethylene oxide, (b) a soluble salt of phosphate and a soluble salt of calcium, and (c) a soluble salt of phosphate and a neutralizing acid.

---

**4,129,451**

## SPINNABLE CELLULOSE SOLUTION AND PROCESS FOR MAKING SAME

**Jacques Mensault, Charbonnieres les-Bains, and Henry Rodier, Sainte-Foy-les-Lyon, both of France, assignors to Rhone Poulenc Textile, Paris, France**

**Filed Jul. 14, 1977, Ser. No. 815,852**

**Claims priority, application France, Jul. 16, 1976, 76 22030; Jul. 16, 1976, 76 22032**

**Int. Cl.² C08L *1/24***

**U.S. Cl. 106—168** **16 Claims**

1. A spinnable, shapable solution of native cellulose in dimethylsulphoxide and formaldehyde, said cellulose having a degree of polymerization of at least 400 and a concentration in said solution of at least 6% by weight of cellulose per volume of dimethylsulphoxide, said formaldehyde present in a formaldehyde/cellulose weight ratio of about 0.2 to less than 0.8, said solution having a water content no greater than about 5000 ppm by weight.

---

**4,129,452**

## STABILIZATION OF N,N'-[(THIOCARBONYL)THIO]DIMORPHOLINE

**Curtis A. Franz, Piscataway, N.J., assignor to American Cyanamid Company, Stamford, Conn.**

**Filed Jul. 11, 1977, Ser. No. 814,603**

**Int. Cl.² C08L *91/00***

**U.S. Cl. 106—243** **10 Claims**

1. A stabilized accelerator composition for rubber comprising N,N'-[(thiocarbonyl)thio]dimorpholine and an effective stabilizing amount of an oxirane compound having a molecular weight greater than about 60.

## 4,129,453
## SULFUR COMPOSITION

**Milutin Simic, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.**

**Filed Oct. 29, 1974, Ser. No. 518,438**
**Int. Cl.[2] C09K *3/00***
**U.S. Cl. 106—287.32** **1 Claim**

1. A composition comprising the following ingredients in about the indicated percentages by weight:

| | |
|---|---|
| Sulfur | 86–88% |
| Dicyclopentadiene plasticizer | 2% |
| Asbestos fibers | 2–4% |
| Talc dispersing agent | 8–9.6% |

said asbestos fibers including, by weight, about 40–60% chrysotile and about 40–60% amphibole, the amphibole being predominantly tremolite.

## 4,129,454
## IRON OXIDE BASED PIGMENT AND PROCESS FOR PREPARING SUCH A PIGMENT

**Wilhelm E. Pavonet, Flemalle-Haute, Belgium, assignor to Societe de Prayon, Belgium**

**Filed Jan. 5, 1976, Ser. No. 646,609**
**Claims priority, application Netherlands, Jan. 3, 1975, 7500055**
**Int. Cl.[2] C09C *1/24***
**U.S. Cl. 106—304** **17 Claims**

1. A process for producing iron oxide based pigment in alpha $Fe_2O_3$ form, comprising calcining at a temperature from 600° to 800° C. and during a period from 2 to 240 minutes a starting material which consists of basic iron sulfate residues and/or jarosite based residues, said residues having resulted from the preparation of zinc sulfate solutions from roasted blende and therefore containing at least zinc impurities, so as to decompose such basic iron sulfates and/or jarosite, performing the calcining in an atmosphere containing $SO_2$ in gaseous phase and controlling the $SO_2$ content of said atmosphere to produce a pigment of the desired color shade, discontinuing the calcining at a time within said period at which the calcined product still has an iron bonded sulfur content of more than 0.6%, solubilizing the not decomposed iron sulfates with other soluble sulfated metals, such as zinc sulfate, by lixiviating the calcined product, and separating these water-soluble compounds.

## 4,129,455
## DISPERSIONS

**Morice W. Thompson, Maidenhead, and Arthur Topham, Middleton, both of England, assignors to Imperial Chemical Industries Limited, London, England**

**Continuation of Ser. No. 495,042, Aug. 5, 1974, abandoned. This application May 7, 1976, Ser. No. 684,356**
**Claims priority, application United Kingdom, Aug. 21, 1973, 39428/73**
**Int. Cl.[2] C04B *31/40***
**U.S. Cl. 106—308 N** **6 Claims**

1. Composition of matter comprising a finely divided dispersion of a solid having a particle size of less than 20 microns in an organic liquid selected from the class consisting of hydrocarbons and halogenated hydrocarbons containing dissolved therein a reaction product obtained by chemical reaction of one or more compounds from each of the following classes:

(a) an aliphatic, cycloaliphatic or aromatic hydrocarbon substituted by at least two isocyanate groups;

(b) an aliphatic diol containing from 5 to 10 methylene groups, and

(c) an addition polymer containing an hydroxy group consisting of the reaction product of an alkylene oxide with a phenol, an aliphatic alcohol or an aliphatic amine wherein such alcohol or amine contains a chain of at least 12 carbon atoms.

## 4,129,456
## METHOD OF REMOVING DENTAL CEMENT

**James J. Longo, Wilmington, Del., assignor to DHP Corporation, Wilmington, Del.**

**Filed Feb. 8, 1977, Ser. No. 766,701**
**Int. Cl.[2] B08B *3/08, 3/12***
**U.S. Cl. 134—1** **6 Claims**

1. In a method of removing from a surface a hardened dental cement prepared by mixing a surgical grade metal oxide powder with an aqueous solution containing from about 20% to about 60% of polyacrylic acid having a viscosity determined average molecular weight of from about 5,000 to about 250,000 the improvement comprising forming a substantially aqueous or alcoholic solution of citric acid having a concentration of at least 1 gram citric acid per 10 ml of solution, and applying an amount of said solution to the surface effective to remove said cement.

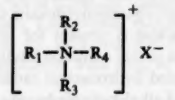
2. In the method of claim 1 wherein the surface is on a dental product, placing the solution in an ultrasonic cleaner, and immersing the cement containing dental product in the citric acid solution, and utilizing mechanical agitation from the ultrasonic cleaner to enhance the removal of the cement.

## 4,129,457
## POST-POLISHING CLEANING OF SEMICONDUCTOR SURFACES

**Jagtar S. Basi, Fishkill, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed May 23, 1977, Ser. No. 799,886**
**Int. Cl.[2] B08B *3/08***
**U.S. Cl. 134—2** **9 Claims**

1. In a method for cleaning a semiconductor surface following the polishing of said surface with a polishing slurry containing colloidal silica, the improvement comprising removing said colloidal silica from said surface by contacting said surface with an aqueous quarternary ammonium salt solution containing at least about 0.1 percent by weight of a quarternary ammonium salt represented by the formula:



where

$R_1$ is a long chain alkyl group containing about 12 to 18 carbons; $R_2$, $R_3$ and $R_4$ are selected from the group consisting of lower alkyl groups and substituted lower alkyl groups having 1 to 7 carbon atoms including various combinations thereof and $X^-$ is an anion, so as to coagulate and suspend said silica in said solution and then removing said solution from said surface.

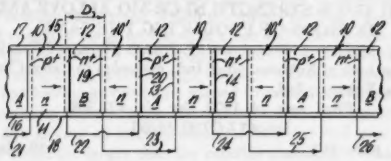
## 4,129,458
## SOLAR-CELL ARRAY

**Roy Kaplow, Newton; Robert I. Frank, Lexington, and Joel L. Goodrich, Quincy, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.**

**Filed Feb. 13, 1978, Ser. No. 877,356**
**Int. Cl.[2] H01L *31/06***
**U.S. Cl. 136—89 PC** **14 Claims**

1. A semiconductor solar-cell array comprising a plurality of spaced, elongate, parallel units formed from a common substrate and comprised of a first conductivity type, the body material of each of said units having the same spaced relation to the body material of other of said units as in the original substrate from which they are formed, each unit having upstanding sidewalls and having therebetween an upper surface adapted for exposure to receive incident radiation, adjacent pairs of sidewalls at first spaces between adjacent units each including a region of a second conductivity type, adjacent

pairs of sidewalls at second spaces between adjacent units being devoid of second conductivity-type regions, first-space pairs of sidewalls being in alternating interlace with second-



space pairs of sidewalls in a given direction of traverse of the units of said array, and ohmic connections extending between the second conductivity-type region of one unit and a first conductivity-type region of an adjacent unit.

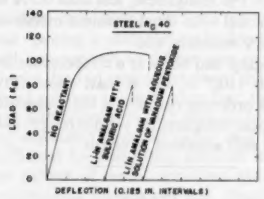
---

## 4,129,459

## METHOD FOR DIMINISHING THE STRENGTH AND DUCTILITY OF STEEL UTILIZING A LITHIUM-INDIUM-AMALGAM CONTAINING A SMALL AMOUNT OF VANADIUM PENTOXIDE

**Clarence H. Walker, Jr., Phoenix, Ariz., and John D. Corrie, Philadelphia, Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Aug. 25, 1966, Ser. No. 576,502**
**Int. Cl.[2] C23C 1/10; C22C 7/00; B26F 3/00**
**U.S. Cl. 148—4** **4 Claims**


STEEL $R_B$ 40
NO REACTANT
1.5% AMALGAM WITH NITRIC ACID
1.5% AMALGAM WITH AQUEOUS SOLUTION OF VANADIUM PENTOXIDE
LOAD (Kg.)
DEFLECTION (0.125 IN. INTERVALS)

1. In a method for diminishing the strength and ductility of steel comprising contacting said steel with a reactant consisting essentially of an amalgam containing about 0.75 to 1.25 weight percent lithium, 0.25 to 0.75 weight percent indium, and about 98 to 99 weight percent mercury, the improvement comprising intimately commingling with said amalgam a small amount of an aqueous solution of vanadium pentoxide.

3. A reactant for diminishing the strength and ductility of steel consisting essentially of a small amount of an aqueous solution of vanadium pentoxide intimately commingled with an amalgam consisting essentially of about 0.75 to 1.25 weight percent lithium, 0.25 to 0.75 weight percent indium, and about 98 to 99 weight percent mercury.

---

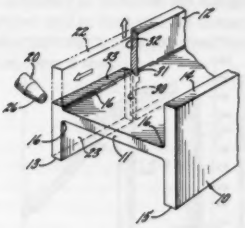
## 4,129,460

## METHOD FOR COPING I-BEAMS

**Theodore F. Brolund, Rockford, and William B. Scott, Rochelle, both of Ill., assignors to W. A. Whitney Corp., Rockford, Ill.**

**Filed Nov. 3, 1977, Ser. No. 848,221**
**Int. Cl.[2] B23K 7/00**
**U.S. Cl. 148—9 R** **6 Claims**

1. A method of coping the end portion of a metal I-beam having a longitudinally extending web disposed in a generally horizontal plane and having longitudinally extending upper and lower flanges projecting upwardly and downwardly, respectively, from one margin of the web, said method comprising the steps of, moving a metal melting tool along a generally vertical path spaced longitudinally from one end of the beam and extending along the outer sides of said flanges between the lower edge of said lower flange and the upper edge of said upper flange, directing metal melting energy from said tool toward the outer sides of said flanges during such movement to form a vertical cut through said flanges, moving said tool longitudinally along a path located between said web and the upper edge of said upper flange and extending along the outer side of said upper flange between said vertical cut and said one end of said beam, directing metal melting energy from said tool toward the outer side of said upper flange during



movement of said tool along the last-mentioned path to form a longitudinal cut through said upper flange and to permit removal from the beam of that portion of the upper flange located longitudinally from said vertical cut and above said longitudinal cut, and thereafter shearing downwardly through said one margin of said web along a line located inwardly of said flanges and extending from said vertical cut to said one end of said beam to remove from the beam those portions of the flanges and the web located outwardly of said line, longitudinally of said vertical cut and below said longitudinal cut.

---

## 4,129,461

## FORMABLE HIGH STRENGTH LOW ALLOY STEEL

**Moinuddin S. Rashid, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.**

**Continuation-in-part of Ser. No. 642,457, Dec. 19, 1975, abandoned. This application Apr. 7, 1977, Ser. No. 785,339**
**Int. Cl.[2] C21D 7/00**
**U.S. Cl. 148—12.3** **10 Claims**

1. The method of producing a high strength low alloy steel having improved formability comprising the steps of:

heating a high strength low alloy steel having alloy constituents taken from the group consisting of the carbides, nitrides and carbonitrides of the metals taken from the group consisting of V, Ti, and Nb to at least the lowermost eutectoid temperature of said steel for a time sufficient to at least partially transform the microstructure of said steel to austenite and to dissolve a substantial proportion of said constituents into the austenite without appreciable grain growth and then cooling said steel to substantially room temperatures so as to substantially lower the yield strength and improve the formability of said steel while maintaining the tensile strength thereof; and

plastically deforming said steel an amount equivalent to at least 2% strain on the tensile stress-strain diagram to effect a substantial increase in the yield strength after said deformation.

---

## 4,129,462

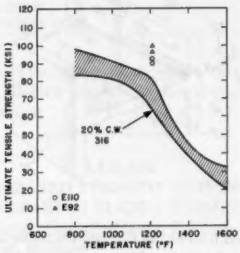
## GAMMA PRIME HARDENED NICKEL-IRON BASED SUPERALLOY

**Michael K. Korenko, Richland, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Apr. 7, 1977, Ser. No. 785,640**
**Int. Cl.[2] C22C 38/08**
**U.S. Cl. 148—31** **4 Claims**

1. A gamma prime strengthened and solid solution hardened

nickel-iron base alloy useful for fast reactor duct and cladding applications, the composition of said alloy imparting improved resistance to swelling in a neutron irradiation environment to said alloy, consisting essentially of from about 7.0 weight percent to about 10.5 weight percent chromium, from about 24 to about 35 weight percent nickel, from about 2.0 to about 3.3 weight percent molybdenum, from about 1.7 to about 2.5 weight percent titanium, from about 0.3 to about 1.0 weight percent aluminum, from about 0.5 to about 1 weight percent silicon, from about 0.03 to about 0.06 weight percent carbon, a maximum of about 2.0 weight percent manganese, and the balance iron, wherein said low chromium concentration range inhibits the formation of the detrimental sigma phase, and said silicon concentration range acts as a swelling inhibitor to the low chromium and low to intermediately low nickel range, which nickel composition range minimizes neutron absorption, and said molybdenum concentration range inhibits Laves phase precipitation induced by neutron irradiation, and wherein said alloy swells less than 0.3% at the peak swelling temperature of 538° C. at the fluence of $2.2 \times 10^{22}$ n/cm$^2$ (E > 0.1 MeV), and wherein said alloy exhibits an ultimate tensile strength in the range of about 90 to 100 ksi at 650° C.



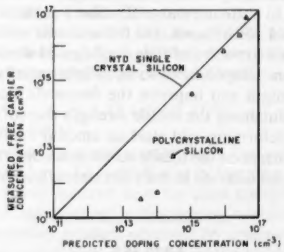

---

**4,129,463**

**POLYCRYSTALLINE SILICON SEMICONDUCTING MATERIAL BY NUCLEAR TRANSMUTATION DOPING TRANSMUTATION DOPING**

**John W. Cleland, Knoxville; Russell D. Westbrook; Richard F. Wood, both of Oak Ridge, and Rosa T. Young, Knoxville, all of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Jun. 29, 1977, Ser. No. 811,348**
**Int. Cl.[2] B05D *3/06*; H01L *27/14***
**U.S. Cl. 148—33** **8 Claims**




1. A semiconductor material comprising polycrystalline silicon having a mean grain size less than 1000 microns containing phosphorus atoms dispersed throughout said polycrystalline silicon rather than at the grain boundaries said semiconductor material prepared by exposing polycrystalline silicon containing $^{30}Si$ to a neutron flux to cause the transmutation of $^{30}Si$ to $^{31}P$, thereby providing polycrystalline silicon containing dispersed phosphorus atoms, and then annealing said polycrystalline silicon containing phosphorus to remove radiation damage.

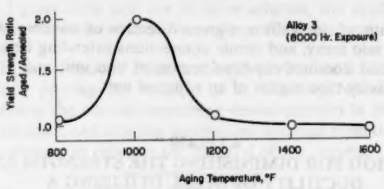
---

**4,129,464**

**HIGH YIELD STRENGTH NI-CR-MO ALLOYS AND METHODS OF PRODUCING THE SAME**

**Steven J. Matthews, Greentown; H. Joseph Klein, and Frank G. Hodge, both of Kokomo, all of Ind., assignors to Cabot Corporation, Kokomo, Ind.**

**Filed Aug. 24, 1977, Ser. No. 827,330**
**Int. Cl.[2] C22C *19/05***
**U.S. Cl. 148—162** **10 Claims**




1. In a process for producing a high strength material having good ductility to provide a ductile, high strength, corrosion resistant alloy, the steps comprising:

(1) preparing a body of material having a composition consisting essentially of by weight, about 13% to 18% chromium, about 13% to 18% molybdenum, less than 0.01% carbon, less than about 6% iron, less than about 2.50% cobalt, less than about 4% tungsten, less than 0.5% aluminum, less than 1% manganese, less than 0.5% silicon, and the balance nickel with usual transient metals and impurities in ordinary amounts, and

(2) thereafter aging said body at a temperature in the range about 900° to 1100° F. for at least about fifty hours to effect an $A_2B$ ordering reaction in the composition and an increase in room temperature yield strength at least about 1.5 times the mill annealed strength.

---

**4,129,465**

**SMOKE-GENERATING COMPOSITION**

**Duane M. Johnson, Loogootee, and Henry A. Webster, III, Ellettsville, both of Ind., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Jul. 21, 1977, Ser. No. 817,896**
**Int. Cl.[2] C06B *45/10*; C06D *3/00***
**U.S. Cl. 149—19.3** **8 Claims**

1. A smoke-generating composition comprised, by weight, of

about 50 percent of phosphorus
between 37 and 44 percent of calcium sulfate,
between 3 and 10 percent of boron, and
about 3 percent of a binder.

---

**4,129,466**

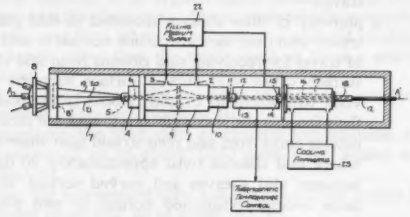
**METHOD FOR IMPREGNATING STRANDED WIRES DURING STRANDING THEREOF**

**Antonio Portinari, Sesto San Giovanni (Milan), and Piero Lavezzari, Desio (Milan), both of Italy, assignors to Industrie Pirelli Societa per Azioni, Milan, Italy**

**Continuation of Ser. No. 569,806, Apr. 21, 1975, abandoned.**
**This application Dec. 20, 1976, Ser. No. 752,477**
**Claims priority, application Italy, May 28, 1974, 23225 A/74**
**Int. Cl.[2] H01B *13/16***
**U.S. Cl. 156—48** **5 Claims**

1. In a process for manufacturing a grouped strand for a fully-filled electric cable, said strand comprising a plurality of electrically conductive components of elongated shape

stranded together with spaces between said components filled with, and the exterior of the strand coated by, a water-impermeable and electrically insulating filling medium which has a predetermined dropping point temperature and which is semi-solid at room temperature, the method of forming, filling and coating said strand which comprises feeding a plurality of said components in unstranded, close and side-by-side relation into a substantially liquid-tight chamber having an inlet die with an opening therethrough through which said components are fed, having an outlet die spaced from said inlet die and with an opening therethrough through which said components are fed and having an internal diameter between said inlet die and said outlet die larger than the exterior diameter of said strand, circulating said filling medium through said chamber in a direction opposite to the direction of feed of said components and from a first point in said chamber to a second point in said chamber, both said first point and said second point being intermediate said inlet die and said outlet die while maintaining said medium at a temperature at least 5° C. above its dropping point temperature and under a pressure higher than atmospheric pressure, separating said components within said chamber and within said filling medium after passage thereof through said opening in said inlet die by forcing them apart and causing said components to follow non-rectilinear paths between said inlet die and said outlet die so that they are in more widely spaced relation to each other than they are when they pass through said opening in said inlet die each of said components being separated from all other said components by a distance sufficient for said filling medium to flow around the entire outer surface of each component and thereafter, bringing said components together in said chamber and stranding them to form said strand, feeding said strand from said outlet die into a bath of said filling medium at a temperature at least 5° C. above said dropping point temperature and at atmospheric pressure, said bath being at said opening of said outlet die, maintaining said bath at a level above said opening in said outlet die so that said lastmentioned opening and said strand are maintained covered by said filling medium during the passage of the strand from said outlet die through said bath, and while feeding said strand out of said bath, cooling the medium on said strand to a temperature at least 5° C. below said dropping point temperature and smoothing and shaping the medium on said strand.



---

**4,129,467**

## METHOD FOR MAKING PACKING CONTAINERS

**Kent I. Knutsson, Landskrona, Sweden, assignor to AB Ziristor, Lund, Sweden**

**Continuation of Ser. No. 621,598, Oct. 10, 1975, abandoned.**
**This application Apr. 20, 1977, Ser. No. 789,246**
**Claims priority, application Sweden, Oct. 18, 1974, 74131525**
**Int. Cl.[2] B29C *27/02*; B32B *31/26***
**U.S. Cl. 156—84** **3 Claims**

1. A method for making, filling and sealing packing containers for liquids composed of a heatshrinkable laminated material having a base layer of foamed plastic and at least one layer of a thermoplastic, heatsealable material, said method comprising:

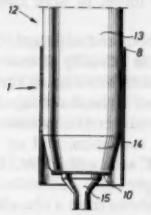
wrapping a strip of the laminated material about a cylindrical mandrel to overlap the opposed ends of the strip,

heating the overlapping end portions of the strip to heat seal the strip end portions together to form a tubular member,

moving said tubular member relative to the mandrel so that one end thereof extends beyond the corresponding end of said mandrel,

placing a bottom forming plate member against the end of the mandrel, the plate member having a diameter not greater than the diameter of the end of the mandrel,

heating the extended end of the tubular member of laminated material to shrink the extended end portion of the tubular member inwardly to embrace the marginal surface of the plate member and to heat seal the inwardly shrunk end of the tubular member to the marginal surface of the plate member to form a seal,



applying pressure to the end of the tubular member and plate member while still in a heated condition, to provide a liquid tight seal therebetween and to provide the base portion of the container with a flat, substantially uniform surface for stability,

removing the container from the mandrel,

filling the container with liquid contents,

heating the upper edge of the container to a heat-sealing temperature, and

pressing a lid member thereonto in abutting relation to the heated upper edge of the filled container to form a liquid-tight butt seal therewith.

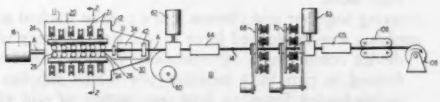
---

**4,129,468**

## METHOD AND APPARATUS FOR MANUFACTURING OPTICAL COMMUNICATION CABLES

**Emil D. Knab, Cumming, Ga., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Apr. 13, 1977, Ser. No. 787,110**
**Int. Cl.[2] D01H *7/10*; B32B *5/02*; G02B *5/14***
**U.S. Cl. 156—148** **17 Claims**



1. Method for manufacturing an optical cable comprising a helically stranded stacked array of optical fiber ribbons comprising:

directing said ribbons from a plurality of ribbon supply reels mounted on a platform rotatable about a predetermined axis, where each said reel pivots about an axis substantially parallel to said predetermined axis, into substantially parallel paths of travel in a predetermined plane with the faces of said ribbons being normal to said plane and said parallel paths being substantially coincident with said predetermined axis with at least one curved stationary surface for contacting each of said ribbons, where said surface has an axis of curvature substantially parallel to said predetermined axis and tangentially intersects said predetermined plane for gradually directing each said corresponding ribbon into said predetermined plane with the ribbon face of each said ribbon parallel to said plane, and a plurality of idler sheaves mounted in said plane with

their axes of rotation normal to said plane for receiving said ribbons from said curved surface;

controlling the orientation of the ribbon faces of said ribbons until said ribbons enter said substantially parallel paths with said curved stationary surface and said idler sheaves;

substantially mechanically supporting said ribbons until they enter said parallel paths of travel with said curved stationary surface and said idler sheaves, said curved stationary surface supporting transverse displacements of said ribbons in the planes of their faces;

bringing together said ribbons into a precise stacked array;

applying a spring-loaded force to said stacked array with a device comprising a dimensionally varying orifice being formed in part by a movable wall, which supplies said spring-loaded force, to urge compacting of said ribbon stack; and

rotating said ribbons and said stacked array about said predetermined axis to helically strand said stacked array.

8. Method of manufacturing an optical cable comprising a core of optical fiber ribbons arranged in a helically stranded stacked array, a first layer of insulation, an inner tubular jacket, a second layer of insulation, and an outer cable jacket with helically stranded and embedded strength members, said method comprising:

directing said ribbons from a plurality of ribbon supply reels mounted on a platform rotatable about a predetermined axis, where each said reel pivots about an axis substantially parallel to said predetermined axis, into substantially parallel paths in a predetermined plane with faces of said ribbons normal to said plane and said parallel paths being substantially coincident with said predetermined axis with at least one curved stationary surface for contacting each of said ribbons, where said surface has an axis of curvature substantially parallel to said predetermined axis and tangentially intersects said predetermined plane for gradually directing each said corresponding ribbon into said predetermined plane with the ribbon face of each said ribbon parallel to said plane, and a plurality of idler sheaves mounted in said plane with their axes of rotation normal to said plane for receiving said ribbons from said curved surface;

controlling the orientation of the ribbon faces of said ribbons until said ribbons enter said substantially parallel paths with said curved surface and said idler sheaves;

substantially mechanically supporting said ribbons until they enter said parallel paths of travel with said curved surface and said idler sheaves, said curved surface supporting transverse displacements of said ribbons in the planes of their faces;

bringing together said ribbons into a precise stacked array;

applying a spring-loaded force to said stacked array with a device comprising a dimensionally varying orifice being formed in part by a movable jaw which supplies said spring-loaded force, to urge compacting of said ribbon stack;

rotating said ribbons and said stacked array about said predetermined axis to helically strand said stacked array;

controlling transition of said stacked array into a helically stranded stacked array;

applying said first insulation layer around said core of stacked ribbons;

extruding said inner tubular jacket around said first insulation layer;

applying said second insulation layer around said inner tubular jacket;

feeding said strength members from a payout assembly;

extruding said outer cable jacket in a jacket-forming cavity;

introducing said longitudinal strength members and the insulated and tubular jacketed cable structure into said jacket-forming cavity through guiding orifices of a nosepiece formed at the end of a hollow core tube; and

generating unidirectional helical stranding of said strength members in said jacket-forming cavity by rotating in synchronization and about the cable axis of travel the feeding means and said core tube.

9. Apparatus for manufacturing an optical cable comprising a plurality of helically stranded and stacked optical fiber ribbons comprising:

a strander comprising:

a platform rotatable about a predetermined axis to helically strand said ribbons;

a payout mounted to said platform, said payout comprising:

a plurality of reels for supplying ribbons, each reel pivotable about an axis substantially parallel to said predetermined axis;

at least one curved stationary and nonrotating surface with which said ribbons make sliding contact, said surface having an axis of curvature substantially parallel to said predetermined axis and tangentially intersecting a predetermined plane of travel for gradually directing each said corresponding ribbon into said predetermined plane of travel with the ribbon face of each said ribbon parallel to said plane of travel;

a plurality of idler sheaves mounted in said plane of travel with their axes of rotation normal to said plane of travel for receiving said ribbons from said curved surface where said curved surface supports transverse displacements of said ribbons in the planes of their faces to allow said ribbons to seek out their most natural paths from said reels to said idler sheaves and where said ribbons twist approximately 90 degrees between said sheaves and curved surface so their faces become positioned normal to said plane of travel; and

means for stacking said ribbon into a precise stacked array.

---

**4,129,469**

## SPLICING PROCESS AND APPARATUS

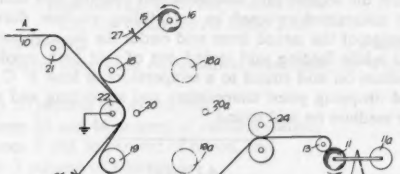
**Christopher Deverell, Rosenberg, Netherlands, and Ronald W. Wells, Welwyn Garden City, England, assignors to Imperial Chemical Industries Limited, London, England**

**Filed Jul. 12, 1977, Ser. No. 815,027**

**Claims priority, application United Kingdom, Aug. 12, 1976, 33603/76**

**Int. Cl.**[2] **B31F** *5/00;* **B65H** *17/28, 19/18*

**U.S. Cl. 156—157** **9 Claims**



1. A threading operation in a process for the production of a web, said operation comprising the steps of sequentially

feeding a production web to a dump location while threading a leader web through a subsequent stage in the process,

transporting the threaded leader web at a linear speed substantially equal to that of the production web,

electrostatically splicing the production and leader webs together by bringing the moving webs into surface-to-surface contact, the webs being transported in substantially the same direction of movement in the region of surface-to-surface contact, and depositing electrostatic charges on

at least one of the moving webs so that the webs adhere electrostatically, and

then severing the production web from that which has passed to the dump location, so that the conditions for splicing are established in advance of the instant when splicing must occur.

---

**4,129,470**

## METHOD OF PREPARING A POROUS IMPLANTABLE MATERIAL FROM POLYTETRAFLUOROETHYLENE AND CARBON FIBERS

**Charles A. Homsy, 11526 Raintree Cir., Houston, Tex. 77024**

**Division of Ser. No. 515,443, Oct. 17, 1974, Pat. No. 3,992,725, which is a continuation-in-part of Ser. No. 416,641, Nov. 16, 1973, abandoned, which is a continuation of Ser. No. 145,497, May 20, 1971, abandoned. This application Jun. 7, 1976, Ser. No. 694,056**

**Int. Cl.[2] B29D *27/00*; B32B *31/00***

**U.S. Cl. 156—155** **10 Claims**

1. A method of preparing an implantable composition of material which comprises

mixing together in an organic liquid media, carbon fibers, polytetrafluoroethylene fibers, polytetrafluoroethylene resin, and from 60 to 80 percent of a material soluble in solvents other than the media used to form a uniform slurry,

filtering the slurry to form a filter cake having a reduced amount of organic liquid media,

compressing the filter cake at elevated temperatures at a pressure of up to about 3,000 pounds per square inch ($lbs/in^2$),

rolling the compressed filter cake between rolls heated between about 100° up to about 280° F.,

drying the rolled cake at a temperature of up to about 350° F.,

sintering the dry cake at temperatures between 600° and 680° F., at a pressure of up to about 5,000 $lbs/in^2$, for a period in excess of three minutes;

leaching said sintered cake to remove said soluble material and subsequently drying same, to produce a material having spheroidal and dendritic spaces therein and which is bio-compatible.

5. The method according to claim 1 wherein the implantable composition is bonded on at least one side thereof to a bonding material including the steps of

leaching from the surface of the sintered cake, that is to be bonded, the soluble material,

drying the leached material, and

bonding a bonding material to the surface of the material from which the soluble material has been leached.

---

**4,129,471**

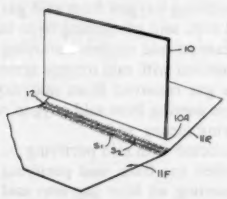
## BOOKBINDING TECHNIQUE

**Bernard Rome, New York, N.Y., assignor to Rome Industries, Inc., New York, N.Y.**

**Continuation-in-part of Ser. No. 583,891, Jun. 5, 1975, abandoned. This application May 13, 1976, Ser. No. 683,461**

**Int. Cl.[2] B32B *3/04*; B31F *3/00*; B42D *1/00***

**U.S. Cl. 156—211** **9 Claims**




1. A method of making a binder to be used in the subsequent binding together of a stack of sheets comprising defining a backbone zone and flanking cover sections in a one-piece panel of folder material, applying a substantially uniform band of hot-melt adhesive in the liquid state to said backbone zone, the margins of said band overlying said backbone zone and extending slightly into said cover sections, and folding said panel while said adhesive band is still wet and non-resistant so that said backbone zone is substantially in one plane and said flanking cover zones are in planes substantially perpendicular thereto, and cooling said hot melt adhesive so that it sets in a general U-shape in cross-section as it extends throughout said backbone zone and slightly into said cover sections along the edges of said backbone zone, thereby to complete said binder to be used for the subsequent binding of a stack of sheets therewithin.

---

**4,129,472**

## COMPOSITION AND USE OF ETHYLENE COPOLYMERIZATES AS FUSIBLE ADHESIVE

**John Hobes, Dinslaken, and Wolfgang Payer, Wesel, both of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Germany**

**Filed May 13, 1977, Ser. No. 797,550**

**Claims priority, application Fed. Rep. of Germany, May 22, 1976, 2623006**

**Int. Cl.[2] C09J *5/00***

**U.S. Cl. 156—331** **14 Claims**

1. A method of bonding two objects together which comprises disposing therebetween a fusion adhesive, said fusion adhesive comprising an olefin polymer comprising 70 to 95% by weight ethylene, 0.5 to 10% by weight of an amide of an unsaturated carboxylic acid and 0.5 to 15% by weight of an unsaturated carboxylic acid and fusing said objects together.

12. A fusion adhesive comprising an olefin copolymer comprising 70 to 95% by weight of ethylene, 0.5 to 10% by weight of an amide of an unsaturated carboxylic acid and 0.5 to 15% by weight of an unsaturated carboxylic acid.

---

**4,129,473**

## APPARATUS FOR THE AUTOMATIC LABELLING OF OBJECTS OF DIFFERING SHAPES

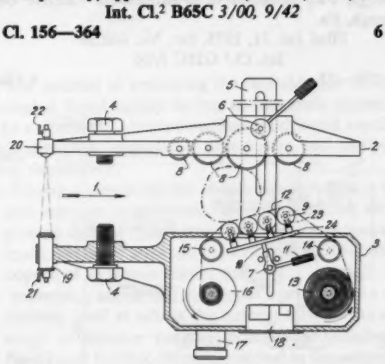
**Jean Y. Perret, Domaine de Soulance, Martres-Tolosane, Haute-Garonne, France**

**Filed Sep. 27, 1976, Ser. No. 726,615**

**Claims priority, application France, Oct. 3, 1975, 75 30320**

**Int. Cl.[2] B65C *3/00, 9/42***

**U.S. Cl. 156—364** **6 Claims**




1. Apparatus for automatically labelling objects of varying shapes conveyed for labelling to a labelling device comprising mounting means for mounting said labelling device adjacent to said conveyed objects for pivotal movement about an axis generally perpendicular to the plane of movement of said objects, and pressure contact means forming a convergent path (way) leading to said labelling device and a divergent path

away from said device for urging said conveyed objects against said labelling device and releasing them after labelling.

---

**4,129,474**

## RETREADING OF TIRES

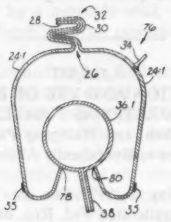
**Aubrey W. Martin, Heilbron, South Africa, assignor to Republic Rubber Industries (Prop.) Ltd., Heilbron, South Africa**

**Filed Feb. 2, 1977, Ser. No. 765,044**

**Claims priority, application South Africa, Feb. 27, 1976, 76/1179**

**Int. Cl.² B29H *17/36***

**U.S. Cl. 156—394** **14 Claims**




1. Tire retreading apparatus including a flexible envelope which can totally enclose the assembly of a tire casing and a tread positioned on the tread zone of the tire casing so that the envelope covers the internal and the external surfaces of the assembly, a tubular rim on which a tire casing enclosed in the envelope is locatable so that the tyre is axially restrained on the rim and so that an annular cavity is defined between the rim and the tire casing enclosed in the envelope located on the rim, and an expandible tube which is positionable in the annular cavity and is an annulus of an elastic material and is fast with the flexible envelope and at least a part of the flexible envelope covering the internal surface of the tire casing forming a part of the expandible tube, the expandible tube being expandible by being inflatable by a gas under pressure to thereby pressurize the annular cavity to force the envelope against the internal surface of the tire casing to thereby stress the tire casing.

---

**4,129,475**

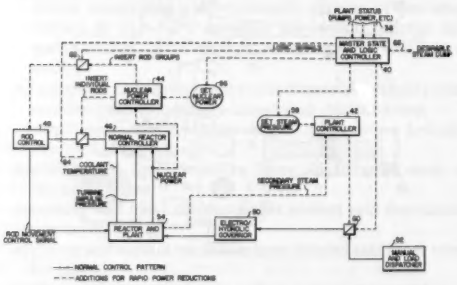
## METHOD OF OPERATING A NUCLEAR REACTOR

**Anthony J. Spurgin, San Diego, Calif., and William F. Schaefer, Pittsburgh, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Jul. 31, 1975, Ser. No. 600,547**

**Int. Cl.² G21C *7/06***

**U.S. Cl. 176—22** **6 Claims**




1. A method of controlling the operation of a nuclear reactor in the event of a malfunction in specified operating components, wherein the reactor includes a nuclear core for generating heat, a plurality of control elements movable into and out of the core for controlling the reactivity of the core and heat removal means for cooling the core, comprising the steps of,

monitoring the operation of the specified components providing a corresponding representative electrical output upon the occurrence of a malfunction;

completely inserting prearranged control elements in groups sequentially into the core in response to the electrical indication of a malfunction until the reactivity of the core is reduced to a first predetermined power level;

selectively, individually, inserting control elements not yet inserted, according to a designed sequence when the core power level is lowered to the first predetermined power level until the power level of the core is reduced to a second predetermined value which is specificed for the respective components monitored at a corresponding value the reactor can safely operate at during power operation with the respective components out of operation and wherein the first predetermined power level is specified for the respective components at a value above the second predetermined power level, which is less than or equal to the power reduction resulting from the complete insertion of one prearranged group of control elements; and

controlling the heat removed from the core by the heat removal means as a function of the reduced core power to substantially maintain the normal operating temperatures of the reactor for power generation.

---

**4,129,476**

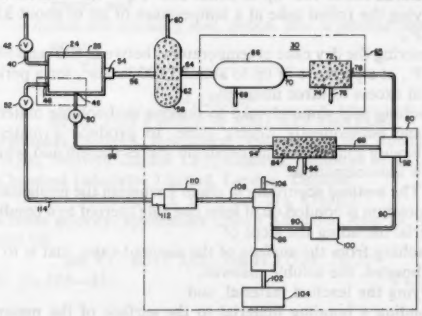
## ENVIRONMENT CONTROL SYSTEM

**Dino G. Sammarone, Edgewood Borough, Pa., assignor to The United States of America as representedby the United States Department of Energy, Washington, D.C.**

**Filed Jul. 28, 1976, Ser. No. 709,473**

**Int. Cl.² G21C *9/00***

**U.S. Cl. 176—37** **15 Claims**



1. A system for controlling the environment of an enclosed area in a nuclear reactor installation comprising:

an enclosed area containing a gas, said area being enclosed by a plurality of walls;

means extending through one of said walls for inserting oxygen into said enclosed area;

means extending through one of said walls for inserting an inert gas into said enclosed area;

means extending through one of said walls for removing said gas from said enclosed area;

means interconnected with said enclosed gas removing means for removing oxygen from said gas removed from said enclosed area, said gas passing from said enclosed gas removing means to said oxygen removing means;

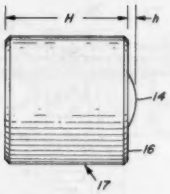
means interconnected with said oxygen removing means for purifying the gas removed from said oxygen removing means, said gas passing from said oxygen removing means to said purifying means; and

means interconnected with said purifying means for supplying said purified gas from said purifying means to said means for inserting an inert gas into said enclosed area, whereby the gas removed from said enclosed area has removed therefrom any oxygen it contains, is purified and is capable of being reinserted into said enclosed area as said inert gas.

## 4,129,477
## AXIALLY ALIGNABLE NUCLEAR FUEL PELLETS

Eric B. Johansson, San Jose; Dale H. Klahn, Berkeley, and Mickey O. Marlowe, Livermore, all of Calif., assignors to General Electric Company, San Jose, Calif.

Filed Dec. 8, 1976, Ser. No. 748,652
Int. Cl.[2] G21C 3/02
U.S. Cl. 176—73 48 Claims

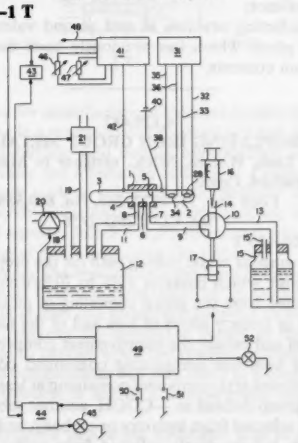



1. In a nuclear fuel element for use in a nuclear reactor, a generally cylindrical axially alignable fuel pellet having a given end surface and an opposite end surface and stacked in a column of a plurality of said pellets in end-to-end relationship within a tubular cladding of said fuel element with an annular gap between said pellets and said cladding and with the given end surfaces of the pellets of the stack abutting the opposite end surfaces of adjacent pellets of the stack, said given end surface of said pellet being formed with a centrally disposed raised area generally convex in shape, and said opposite end surface of said pellet having a shape such that the load-bearing contact area between the pellets in said stack is limited to a portion of the surface of said centrally disposed raised area of said given end surface that is orthogonal to the longitudinal axis of said pellet said contact area being limited sufficient to increase the mean temperature of said contact area during operation in said reactor to increase the ability of the pellets to deform plastically at their interface whereby the alignment forces required to straighten misaligned pellets in said column and the consequent loading on the cladding is decreased.

## 4,129,478
## METHOD FOR MEASURING SUBSTRATE CONCENTRATIONS

Philippe Racine, Münchenstein, Switzerland; Jean-Claude Higelin, Hegenheim; Roland Engelhardt, Mulhouse, both of France, and Wolfgang Mindt, Erlangen, Germany, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 493,583, Aug. 1, 1974, Pat. No. 4,005,002.
This application Oct. 18, 1976, Ser. No. 733,570
Int. Cl.[2] G01N 27/46
U.S. Cl. 204—1 T 4 Claims

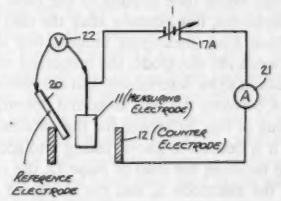


1. A method of measuring the concentration of substrates of enzyme reactions occurring during intermediate metabolism, more particularly the concentration of lactate and glucose in fluid biological samples, wherein the substrate concentration is measured by measuring a current produced by oxidation of an acceptor at an enzyme electrode with a measuring device substantially comprising a measuring cell for receiving the fluid sample, the enzyme electrode and a reference electrode, both electrodes being in contact with the fluid sample, and the enzyme electrode containing a platinum or gold electrode, an enzyme layer and a semi-permeable membrane covering the enzyme layer, the temperature at which the enzymatic reaction takes place being regulated at a pre-determined value and a direct voltage being applied between the enzyme electrode and the reference electrode, which method is characterized by performing a local temperature regulation of the enzyme layer within the enzyme electrode by means of a temperature control of the gold or platinum electrode thereof, filling the measuring cell with a buffer solution containing an acceptor prior to filling the cell with a fluid sample and keeping the cell filled with said buffer solution over a time interval long enough to enable diffusion of a quantity of the acceptor through the semi-permeable membrane of the enzyme electrode into the enzyme-containing layer, said quantity of acceptor being sufficiently high for assuring a linear response of the enzyme electrode, sucking the buffer solution from the measuring cell at the end of said time interval, filling the measuring cell with a fluid sample and measuring the concentration of the substrate contained in the fluid sample by determining the peak value of the current flowing through the enzyme electrode with an electronic circuit.

## 4,129,479
## METHOD OF ANALYZING RESIDUAL CHLORINE

James J. Morrow, Norristown, Pa., assignor to Fischer & Porter Co., Warminster, Pa.

Continuation of Ser. No. 313,644, Dec. 11, 1972, abandoned.
This application Jan. 30, 1975, Ser. No. 545,515
Int. Cl.[2] G01N 27/46
U.S. Cl. 204—1 T 2 Claims




1. The method of measuring the free chlorine residual in a chlorinated liquid supply having an ammonia content giving rise to a combined chlorine residual, said liquid supply being chlorinated by a controllable chlorinator, said method comprising the steps of:

A. feeding a sample stream of said supply which is buffered and contains a potassium bromide additive through a passage defined by the space between the measuring electrode formed of gold and the counter electrode formed of copper of an amperometric cell,

B. impressing across said electrodes a potential at a current-limiting level at which the current flow in the cell as a result of chlorine content increases progressively as a function of the free chlorine residual in the sample stream and is substantially insensitive to the combined chlorine residual therein,

C. measuring said current to indicate the first appearance of said free chlorine residual and,

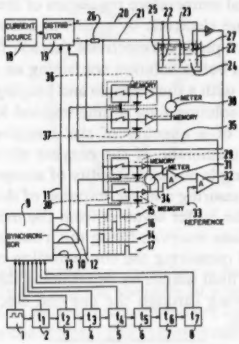
D. controlling the operation of said chlorinator in response to the indication of the first appearance of the chlorine residual so that the degree of chlorination is such as to maintain a breakpoint condition at which ammonia destruction is optimized.

4,129,480

## METHOD AND APPARATUS FOR DETERMINING THE IMMERSED SURFACE AREA OF ONE OF THE ELECTRODES OF AN ELECTRO-CHEMICAL BATH

Eric Robert, Rue du Chapeau Râblé 19, 2300 - La Chaux-de-Fonds, Canton of Neuchâtel, Switzerland

Filed Dec. 20, 1977, Ser. No. 862,399
Claims priority, application Switzerland, Dec. 24, 1976, 16297/76
Int. Cl.[2] G01N *27/26*; C25D *21/12*
U.S. Cl. 204—1 T 6 Claims



1. Method of determination of the immersed surface area of one of the electrodes of an electro-chemical installation including an electrolyte, especially of the cathode, comprising measuring the potential between said electrode and the electrolyte without current being then applied to the bath, applying between the electrodes, immediately after the said measuring, a pulse of defined load; measuring immediately thereafter the potential between the electrode, the immersed surface area of which it is desired to be determined, and the electrolyte; taking the difference between the two measured potentials; and then using the value of this difference for the determination of the surface area it is desired to know, taking into account the fact that the ratio between the load of pulse Q, the immersed surface area of the electrode S, and the measured difference of potentials Δ U responds to the equation

$$Q/S = f(\Delta U), f(\Delta U)$$

being practically constant in a large field of application.

4. Apparatus for determining the immersed surface area of an electrode in an electro-chemical installation including an electrolyte, comprising:

means for generating pulses of current and applying them to the electrodes of the electro-chemical installation;

means for measuring the potential between the electrode, whose immersed surface area is to be determined, and the electrolyte, before and after each pulse;

means for memorizing the measured potential values;

means for effecting the difference between the memorized potential values;

means for controlling said generating means as a function of the difference between the memorized potential values and as compared to an assigned value;

means for displaying of the difference between the memorized potential values;

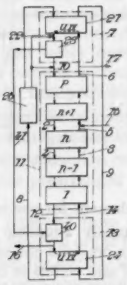
means for displaying the pulse current value, said difference between the potential values and said current value both being indicative of the immersed surface area of the electrode whose immersed surface area is to be determined.

4,129,481

## URANIUM ISOTOPIC ENRICHMENT

Jacques Aubert; Maurice Carlés, and Roger Neige, all of Pierrelatte, France, assignors to Commissariat A l'Energie Atomique, Paris, France

Filed Feb. 11, 1977, Ser. No. 767,984
Claims priority, application France, Feb. 13, 1976, 76 03986
Int. Cl.[2] C25C *1/22*
U.S. Cl. 204—1.5 12 Claims



1. A process for effecting isotopic exchange between a compound of uranium at a first valence and a compound of uranium at a second valence unreactive with the first compound to produce enrichment of the lighter uranium isotope in the compound of uranium at the higher of the first and second valences, said valences being III and IV, which comprises repeating a number of times a cycle which comprises:

contacting an aqueous acid phase loaded with the compound of uranium at the first valence with a different phase loaded with the compound of uranium at the second valence, under conditions such that there is substantially no net transfer of uranium, in either valence state, from one phase to the other;

extracting uranium at said second valence from said other phase, after said contact, by said aqueous phase which has previously been depleted of its uranium contents;

subjecting the uranium contents in said aqueous phase, after said extraction to a valence change from said second valence to said first valence by a process which involves electrolysis, before any new contact with said other phase;

changing the valence of the uranium contained in said aqueous phase, after said contact, from said first valence to said second valence during that same electrolysis which occurs during the change of valence from said second to the first valence;

and transferring uranium at said second valence into said other phase which has previously been depleted of its uranium contents.

---

4,129,482

## ELECTROPLATING IRON GROUP METAL ALLOYS

Ronald J. Lash, Warren, Mich., assignor to M&T Chemicals Inc., Stamford, Conn.

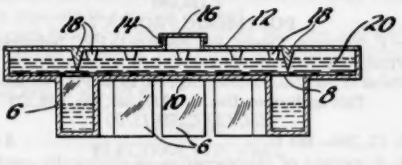
Filed Jun. 24, 1977, Ser. No. 809,558
Int. Cl.[2] C25D *3/56*
U.S. Cl. 204—43 T 14 Claims

8. In an aqueous acidic plating bath for the preparation of an electrodeposit which contains 15% to 70% iron; at least one metal selected from the group consisting of nickel and cobalt or; binary or ternary alloys of iron and of the metals selected from nickel and cobalt; the improvement comprising the presence of at least one complexing compound consisting of a poly-substituted aryl compound containing at least one carboxylic acid group defined as —COOH, another substituent independently selected from hydroxy or carboxy, and one or more substituents independently selected from sulfo, or sulfoalkyl groups.

## 4,129,483
## DEVICE, COMPOSITION AND METHOD FOR IDENTIFYING MICROORGANISMS

Barry R. Bochner, 1546 Arch St., Berkeley, Calif. 94708

Filed Mar. 3, 1977, Ser. No. 773,879
Int. Cl.² C12K 1/10
U.S. Cl. 195—100 29 Claims

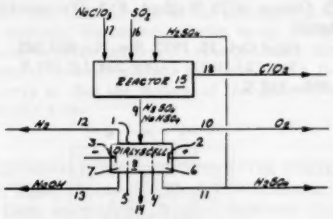



1. A composition for identifying or testing a microorganism by growing a culture of the microorganism in contact therewith, said composition consisting essentially of an aqueous solution containing: (1) an oxidation-reduction indicator which substantially irreversibly undergoes a change in color upon being reduced; (2) a biodegradable test substrate compound which, when catabolized by a microorganism, will engender a reduction of said indicator; (3) a buffer to maintain the pH of the composition at a level which enables microorganism culture growth without engendering or preventing reduction of said indicator; and (4) a microorganism nutrient in a concentration sufficient to support microorganism culture growth without engendering reduction of said indicator.

## 4,129,484
## PROCESS FOR REGENERATION OF SPENT REACTION SOLUTIONS

Karl-Georg Larsson, Trollhättan, Sweden, assignor to Kema-Nord AB, Stockholm, Sweden

Filed May 6, 1977, Ser. No. 794,699
Claims priority, application Sweden, May 11, 1976, 7605372
Int. Cl.² C25B 1/26
U.S. Cl. 204—101 6 Claims




1. A process for manufacture of chlorine dioxide by contacting and mixing in a reaction zone an alkali or alkali earth metal chlorate with sulfuric acid and/or hydrochloric acid in the presence of water and a reducing cathode or a reducing agent for the chlorate such as sulfur dioxide, chloride ion and/or methanol whereby chlorine dioxide is liberated and withdrawn and a residual aqueous solution is produced containing alkali or alkali earth metal ions, comprising the steps of:

(a) withdrawing the residual solution from the reaction zone and feeding it to a compartment of an electrolytic cell containing at least one membrane between an anode and a cathode, whereby the membrane closest to the anode is permeable to cations when the residual solution is fed to the anode compartment and permeable to anions when the residual solution is fed to a compartment opposite the anode,

(b) electrolytically producing hydrogen ions in the anode compartment,

(c) withdrawing the solution from the anode compartment with, in relation to the residual solution, decreased concentration of the alkali or alkali earth metal ions,

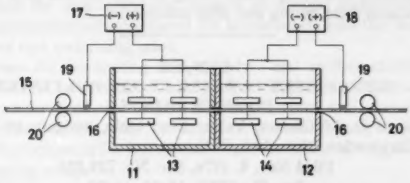
(d) feeding at least a part of the so withdrawn anode compartment solution to the reaction zone, and

(e) withdrawing a product containing alkali or alkaline earth metal ions from a compartment of the cell other than the anode compartment.

## 4,129,485
## METHOD FOR ELECTROLYTIC REMOVAL OF SCALE FROM BAND STEEL

Nobuo Shikata, and Sukemitsu Ito, both of Tokyo, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Oct. 11, 1977, Ser. No. 840,839
Claims priority, application Japan, Oct. 12, 1976, 51/122180
Int. Cl.² C25F 1/06, 1/00
U.S. Cl. 204—144.5 3 Claims




1. A method for the removal of scale composed preponderantly of $Fe_3O_4$ and having a thickness of about 10μ from band steel consisting of a hot rolled steel plate of carbon steel, consisting of the steps of subjecting the band steel to electrolysis for a period of from 3 to 10 seconds in an electrolyte composed of an aqueous solution of sodium chloride at temperatures in the range of from 80° to 100° C., the electrolysis being effected with feed voltages in the range of from 3 to 10 V and current densities in the range of from 0.5 to 1.0 A/cm², with the band steel used as a cathode and an electrode tool as an anode, and then subjecting the band steel to electrolysis for a period of from 15 to 25 seconds in the aqueous solution of sodium chloride at temperatures of from 80° to 100° C., with feed voltages of from 3 to 10V and current densities of from 0.5 to 1.0 A/cm², with the treated band steel used as the anode and the electrode tool as the cathode.

## 4,129,486
## ULTRAVIOLET CURING PRINTING INKS HAVING IMPROVED SHELF LIFE

Albert A. Deutsch, Scarsdale, N.Y.; Richard Dennis, E. Rutherford, N.J., and Robert Gumbinner, Tarrytown, N.Y., assignors to Polychrome Corporation, Yonkers, N.Y.

Filed May 9, 1978, Ser. No. 904,143
Int. Cl.² C08G 18/00, 63/00
U.S. Cl. 204—159.19 7 Claims

1. An ink composition which is curable upon exposure to ultraviolet radiation which comprises:

I. An ethylenically unsaturated oligomer comprising an epoxy or urethane type material having terminal acrylic, methacrylic or allylic groups, a molecular weight of from about 200 to 1300, one carbon-carbon double bond linkage per 50-400 molecular weight units, and a preponderance of which material has a functionality greater than 1; and

II. A photoinitiator system comprising Michler's Ketone and a o-halogen hexa-aryl biimidizolyl compound; and

III. A colorant conventionally employed in forming printing inks.

4,129,487

## PROCESS FOR IMPROVING THE PROPERTIES OF AN AQUEOUS EMULSION TYPE COATING COMPOSITION

Keizo Makuuchi, Sakai; Kunio Araki, Takasaki; Tohru Takagi; Hiroyuki Nakayama, both of Hiratsuka, and Haruo Kozu, Fujisawa, all of Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Feb. 25, 1976, Ser. No. 661,153
Claims priority, application Japan, Feb. 28, 1975, 50-24528
Int. Cl.[2] C08F *8/00*
U.S. Cl. 204—159.14 3 Claims

1. A process for improving the properties of an aqueous emulsion type coating composition containing from 30% to 60% by weight of at least one radiation cross-linkable resin, selected from the group consisting of homo- or co-polymers of an acrylate, vinyl acetate, versatic acid, vinyl chloride and ethylene, wherein said coating composition contains less than 0.5% by weight of a stabilizer having hydroxy groups on the basis of weight of the composition and the composition is irradiated with ionizing radiation at a total dose in the range of from $10^4$ rad to $10^8$ rad before coating the composition on a substrate, said composition being and maintained in a stable emulsion state during and after irradiation.

---

4,129,488

## ULTRAVIOLET CURABLE EPOXY-POLYESTER POWDER PAINTS

Vincent D. McGinniss, Valley City, Ohio, assignor to SCM Corporation, New York, N.Y.

Filed Nov. 8, 1976, Ser. No. 739,526
Int. Cl.[2] C08G *18/00, 63/00*
U.S. Cl. 204—159.19 9 Claims

1. In a dry powder paint composition containing a film-forming binder and having an average powder particle size less than about 325 mesh, the improvement comprising:

said binder being a spatially arranged ethylenically unsaturated epoxy-polyester polymer containing an epoxy adduct and a polyester adduct, said epoxy adduct being spatially arranged by spacing said epoxy adduct from said polyester adduct by an intervening linear polymer chain containing repeating polymer units, said epoxy adduct having a molecular weight at least about 100 and said polyester having a molecular weight of at least about 100, said spatially arranged epoxy-polyester polymer having a molecular weight of between about 1,000 and 10,000 and having a melting point of at least 80° C. whereby the powder becomes fluid upon exposure to moderate heat above 80° C., said epoxy-polyester polymer containing by weight at least about 2% ultraviolet sensitizer connected to said epoxy-polyester polymer for activating and cross-linking the ethylenic unsaturation upon exposure to ultraviolet energy.

---

4,129,489

## PREPARATION OF POLYMER BASED POWDER COATINGS BY IONIZING RADIATION

Roger M. Christenson; Rostyslaw Dowbenko, both of Gibsonia, and Joseph M. Makhlouf, Mars, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 649,118, Feb. 14, 1976, abandoned.
This application Apr. 24, 1978, Ser. No. 899,426
Int. Cl.[2] C08F *2/54*
U.S. Cl. 204—159.22 12 Claims

1. A method of preparing a polymer based powder coating material which comprises the steps of:

(a) preparing a mixture comprising one or more monomers each having substantially no more than one ethylenically unsaturated group, which mixture is polymerizable by means of ionizing radiation to form a thermoplastic, substantially non-crosslinked film;

(b) applying a coating of said mixture to a substrate;

(c) subjecting the coated substrate to ionizing radiation to polymerize said ethylenically unsaturated monomer or monomers in said coating and to thereby form a solid thermoplastic, substantially non-crosslinked film; and

(d) breaking and reducing said film into substantially powder-sized particles of polymer based powder coating composition which when electrostatically deposited upon a substrate and baked, fuse to produce a film.

---

4,129,490

## POLYMERIC PRODUCTS

Karl F. Schimmel, Verona, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 728,368, Sep. 30, 1976, Pat. No. 4,069,210.
This application Dec. 7, 1977, Ser. No. 858,223
Int. Cl.[2] C25D *13/00*
U.S. Cl. 204—181 C 4 Claims

1. A method of electrocoating an electrically conductive surface serving as a cathode in an electrical circuit comprising passing an electric current between said cathode and an anode through an aqueous electrodepositable composition wherein the electrodepositable composition comprises an aqueous dispersion of a non-gelled, internally ionized, quaternary ammonium salt group-containing polymer comprising the reaction product of:

(A) an organic polyepoxide,

(B) a polyamine containing at least two tertiary amine groups, formed from reacting:

(1) an organic polyisocyanate, an organic polycarboxylic acid,

(2) an active hydrogen-containing tertiary amine in which the active hydrogen is selected from the class consisting of hydroxyl, mercapto, primary and secondary amino, (1) and (2) reacted with one another to form a polyamine which is stable in water;

said reaction product being acidified to provide a quaternary ammonium salt group-containing polymer in which the salt groups are located along the polymer backbone.

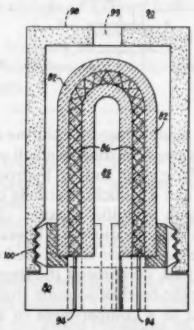
---

4,129,491

## OXYGEN CONCENTRATION ANALYZER

Joseph O. Obiaya, 4773 Walford, #13, Warrensville Heights, Ohio 44128

Filed Oct. 25, 1977, Ser. No. 845,048
Int. Cl.[2] G01N *27/46;* 204 *1 S;195 S*
U.S. Cl. 204—195 S 7 Claims



1. An oxygen concentration analyzer comprising:

(a) a material comprised of zirconium oxide doped with bivalent molecules the presence of which within the material creates oxygen ion vacancies;

(b) a heater embedded with said material for heating said material; said heater configured in the form of a structure with meshes and capable of radiating heat to said material

while allowing oxygen ions in said material to migrate through meshes of said structure;

(c) means for structurally supporting said heater;

(d) a first conductive electrode on one area of said material to facilitate the reduction of oxygen molecules in a first gas;

(e) a second conductive electrode on a second area of said material to facilitate the oxidation of gas ions within said material, said second conductive electrode being located for exposure to a second gas; and

(f) means for electrically connecting said first and second electrodes to means for correlating voltage difference between said electrodes with oxygen concentration within said first or second gas.

---

**4,129,492**

## ELECTROLYTIC CELL

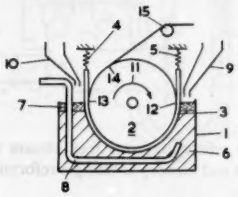
**Peter H. Morton, Solihull; John R. B. Gilbert, Sutton Coldfield, and John P. A. Wortley, Harborne, all of England, assignors to Imperial Metal Industries (Kynoch) Limited, Birmingham, England**

**Filed Dec. 21, 1976, Ser. No. 752,857**

**Claims priority, application United Kingdom, Dec. 23, 1975, 52593/75**

**Int. Cl.[2] C25D** *1/04, 3/38, 17/00*

**U.S. Cl. 204—212** **15 Claims**




1. An electrolytic cell for the production of sheet metal comprising a container for electrolyte, a cylindrical cathode rotatable about its longitudinal axis having part at least of its surface immersed within the electrolyte, an anode of particulate consumable or slowly consumable metallic material, a stereo-reticular array of electrically insulating material in contact with the cathode and anode and spacing the anode from the cathode, the stereo-reticular array being fixed in position relative to the anode and to the container, the cathode being rotatable with its surface in contact with the stereo-reticular array so that the surface of the cathode wipes the stereo-reticular array.

---

**4,129,493**

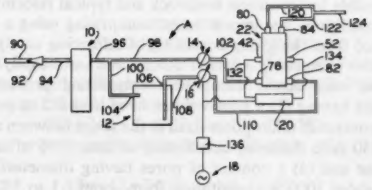
## SWIMMING POOL CHLORINATOR SYSTEM

**Michael R. Tighe, Mentor, and Hugh L. McCutchen, Chardon, both of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio**

**Filed Jun. 30, 1977, Ser. No. 811,989**

**Int. Cl.[2] C25B** *15/02, 9/00, 1/26;* **E04H** *3/20*

**U.S. Cl. 204—228** **3 Claims**




1. A swimming pool chlorinator system comprising in combination:

an ion exchange column including an inlet for receiving a supply of water therein and an outlet for discharging deionized water therefrom;

a briner adapted to receive a portion of said deionized water and convert same to a saturated brine solution;

a single monopolar electrolytic membrane cell having opposed catholyte and anolyte chambers which respectively include an expanded mesh cathode and an unflattened large mesh anode member with said members disposed in a close spaced parallel relationship to each other and separated by a substantially hydraulically impermeable cation exchange membrane, said catholyte chamber including an inlet for receiving a portion of said deionized water discharged from said ion exchange column outlet therein in communication with said cathode and an outlet for discharging sodium hydroxide therefrom during operation of said cell, said anolyte chamber including an inlet for receiving said brine solution from said briner therein in communication with said anode and an outlet for discharging chlorine during operation of said cell;

means for supplying a voltage differential across said cathode and anode to generate a current flow through said cell and effect electrolysis therein;

means for selectively varying the current flow through said cell for controlling the amount of sodium hypochlorite electrolytically produced for introduction into the water of said swimming pool;

means for connecting said catholyte and anolyte chamber outlets externally of said cell such that the individual products of electrolysis discharged from said chambers therethrough may be mixed together forming sodium hypochlorite for introduction into the water of said swimming pool;

a first pump adjacent said catholyte chamber inlet for pumping said deionized water thereinto and a second pump adjacent said anolyte chamber inlet for pumping said saturated brine solution thereinto;

and means for conveying said sodium hypochlorite to a pumping system for said swimming pool.

---

**4,129,494**

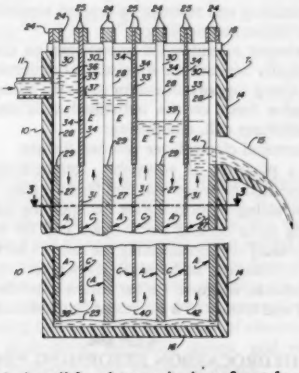
## ELECTROLYTIC CELL FOR ELECTROWINNING OF METALS

**Telfer E. Norman, P. O. Box 781, Green Valley, Ariz. 85614**

**Filed May 4, 1977, Ser. No. 794,623**

**Int. Cl.[2] C25C** *7/00, 7/04*

**U.S. Cl. 204—268** **12 Claims**



1. An electrolytic cell for electrowinning of metals, comprising:

an upright, electrolyte containing tank of rectangular lateral configuration, having uniformly spaced, opposed vertical slots along each of its two interior sides;

a series of upright, generally rectangular anodes extending across said tank and having a width to extend into opposed slots at opposite sides of said tank, said anodes being loosely positioned in alternate slots and removable from said slots;

a series of upright, generally rectangular cathodes extending across said tank and having a width to extend into opposed slots at opposite sides of said tank, said cathodes being loosely positioned in slots alternating with the slots of said anodes and removable from said slots;

an inlet at one end of said tank;

an outlet weir at the opposite end of said tank at a lower elevation than the level of electrolyte at the inlet end of said tank;

the construction and arrangement of said anodes and cathodes being such that the electrolyte is forced to flow in an alternating upward and downward path between said anodes and cathodes;

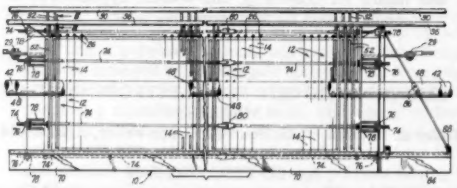
said elevation of said outlet weir being sufficiently below the level of electrolyte at said inlet end of said tank that flow velocities in excess of ten feet per minute will be induced in the electrolyte as it flows downstream between said anodes and cathodes towards the outlet end of said tank and will produce pressure against said anodes and cathodes to maintain said anodes and cathodes against the downstream edges of said slots and spaced from upstream edges of said slots;

means for supplying an electrical current for flow between adjacent anodes and cathodes through said electrolyte.

## 4,129,495
## SUPPORT STRUCTURE FOR PLURAL CELL ELECTROLYZER

**Robert H. Fitch, Syracuse; Bruce E. Kurtz, and Bronislaw B. Smura, both of Marcellus, all of N.Y., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.**

**Filed Dec. 30, 1977, Ser. No. 866,157**
**Int. Cl.[2] C25B *1/16, 1/26, 9/00***
**U.S. Cl. 204—279** **7 Claims**



1. A retaining and restraining support structure for a plural cell electrolyzer, comprising:

(a) a sleeper assembly for supporting an electrolyzer cell vertically beneath the longitudinal dimension thereof;

(b) retaining support means for applying a longitudinal compressive force on the individual cells constituting said electrolyzer cell, comprising:

(i) terminal electrolyzer cell end frames;

(ii) a plurality of adjustable, longitudinal tension bars disposed between said end frames; and,

(c) restraining support means for applying an oblique stabilizing force on said electrolyzer cell for maintaining the individual cells constituting the same in substantially vertical orientation, said restraining support means including adjustable, diagonal tie bar means extending from one of said end frames to a horizontally displaced anchor point.

## 4,129,496
## HYDROCARBON REFORMING PROCESS

**Robert S. Loboda, Hacienda Heights, Calif., assignor to UOP Inc., Des Plaines, Ill.**

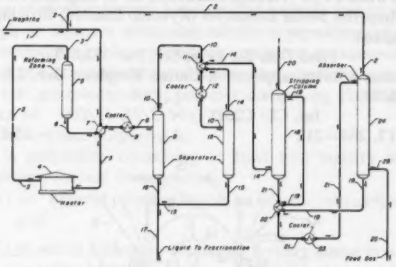
**Continuation-in-part of Ser. No. 706,858, Jul. 19, 1976, Pat. No. 4,058,452. This application Aug. 11, 1977, Ser. No. 823,794**
**The portion of the term of this patent subsequent to May 15, 1994, has been disclaimed.**
**Int. Cl.[2] C10G *35/04***
**U.S. Cl. 208—134** **2 Claims**

1. A process for catalytically reforming a naphtha which comprises the steps of:

(a) passing a feed gas stream comprising hydrogen and a $C_2$ to $C_6$ hydrocarbon through an absorption zone operated under conditions effective to remove the $C_2$ to $C_6$ hydrocarbon, including countercurrent contact with a stripping zone liquid effluent stream, and thereby forming a hydrogen-rich gas stream and an absorption zone liquid effluent stream;

(b) passing the absorption zone liquid effluent stream into a stripping zone operated at conditions effective to cause the removal of the $C_2$ to $C_6$ hydrocarbon from the absorption zone liquid effluent stream, including countercurrent contact with a gaseous stripping media, and thereby forming the stripping zone liquid effluent stream and an off-gas stream comprising hydrogen and the $C_2$ to $C_6$ hydrocarbons;

(c) admixing the hydrogen-rich gas stream with a naphtha feed stream to form a reforming zone feed stream;



(d) passing the reforming zone feed stream through a reforming zone and thereby forming a reforming zone effluent stream;

(e) cooling and effecting a partial condensation of the reforming zone effluent stream and passing the reforming zone effluent stream into a vapor-liquid separation zone operated at conditions effective to form a condensate stream and a separation zone gas stream;

(f) passing the condensate stream to a product recovery zone; and,

(g) passing the separation zone gas stream into a lower portion of the stripping zone as the gaseous stripping media.

## 4,129,497
## HYDROCARBON CATALYTIC REFORMING PROCESS

**Paul W. Tamm, Oakland, Calif., assignor to Chevron Research Company, San Francisco, Calif.**

**Division of Ser. No. 716,924, Aug. 23, 1976, Pat. No. 4,082,697, which is a continuation-in-part of Ser. No. 496,788, Aug. 12, 1974, which is a continuation-in-part of Ser. No. 387,100, Aug. 9, 1973, abandoned. This application Oct. 13, 1977, Ser. No. 841,616**
**Int. Cl.[2] C10G *35/08***
**U.S. Cl. 208—138** **14 Claims**

1. In a catalytic hydrocarbon reforming process using a reformable hydrocarbon feedstock and typical reforming process conditions, the improvement comprising using a catalyst selected from the group consisting of reforming catalyst compositions comprising a carrier component and a catalytic component, said carrier component comprising predominantly alumina having (1) a pore volume of at least 0.5 cc per gram, (2) a content of micropores sized in the range between about 80 and 150 A in diameter constituting at least 70% of said pore volume and (3) a content of pores having diameters greater than about 1000 A constituting from about 0.1 to 3% of said pore volume, said catalytic component being at least one Group VIII noble metal promoted and/or stabilized by at least one material selected from the metals, oxides and halides of the group of elements consisting of rhenium, manganese, germanium, tin, zinc and titanium; said composition containing on a

dry basis and calculated as metal, an amount in the range of from about 0.1 to 3 weight percent of said noble metal, and an amount in said range of said promoter; and said pore-sizes corresponding to sizes determined by the mercury porosimetry method.

---

## 4,129,498
## MAGNETIC SEPARATION

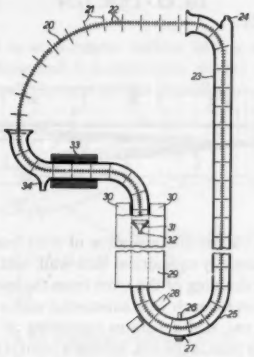
**Norman O. Clark, Par, and James H. P. Watson, St. Austell, both of England, assignors to English Clays Lovering Pochin & Co. Limited, Cornwall, England**

**Filed Nov. 24, 1975, Ser. No. 634,597**

**Claims priority, application United Kingdom, Nov. 22, 1974, 50801/74**

**Int. Cl.² B03C *1/16***

**U.S. Cl. 209—213** **17 Claims**



1. A method of separating native magnetisable particles from a fluid having such particles in suspension therein, which method comprises:

establishing a magnetic field in a predetermined zone,

adding foreign magnetisable particles to the fluid, from which native magnetisable particles are to be separated, the foreign magnetisable particles being relatively large in relation to the native magnetisable particles,

passing the fluid and the native and foreign magnetisable particles into the predetermined zone by means of a chain means which is moved by the action of the fluid and particles on transverse members attached to the chain means, so that native magnetisable particles are magnetised and attracted to foreign magnetisable particles and the foreign magnetizable particles and the entrained native magnetisable particles are magnetically attracted to magnetizable portions of the chain means within the predetermined zone, and

removing the foreign magnetisable particles and entrained native magnetisable particles from the fluid by means of the chain means.

---

## 4,129,499
## OIL SEPARATION MATERIAL

**Roger J. R. Cairns, Woking, and Joan M. Howard née Murtagh, Farnham, both of England, assignors to The British Petroleum Company Limited, London, England**

**Filed Mar. 1, 1977, Ser. No. 773,281**

**Claims priority, application United Kingdom, Mar. 9, 1976, 09311/76**

**Int. Cl.² B01D *17/04, 15/00***

**U.S. Cl. 210—23 R** **22 Claims**

1. A method for separating oil from water contaminated with oil which method comprises passing a contaminated water stream through one or more purification beds containing treated solid particles in such manner that the oil coalesces and an oil phase and a water phase are formed, wherein said treated solid particles comprise solid particles which have been treated with a solution of a hydrocarbon activating agent and a dispersant additive.

3. The method according to claim 1 wherein the dispersant additive is selected from the group consisting of

(1) a copolymer which contains a carboxylic ester group and one or more additional polar groups,

(2) a hydrocarbon polymer having a polar group,

(3) an N-substituted long chain alkenyl succinimide,

(4) a high molecular weight amide or polyamide,

(5) a high molecular weight ester or polyester, and

(6) an amine salt of a high molecular weight organic acid.

---

## 4,129,500
## TREATMENT OF DROPLET DISPERSIONS

**Godfrey V. Jeffreys; Clive J. Mumford, both of Sutton Coldfield; Frank E. G. Ravault, and Colin Washbourne, both of Birmingham, all of England, assignors to Foseco International Limited, Birmingham, England**

**Filed Oct. 29, 1974, Ser. No. 518,963**

**Claims priority, application United Kingdom, Nov. 5, 1973, 51333/73**

**Int. Cl.² B01D *13/00***

**U.S. Cl. 210—23 R** **3 Claims**

1. A method of coalescing the disperse phase of a droplet dispersion which comprises passing the droplet dispersion through a porous body of reticular foam-structured ceramic material of progressively increasing pore size from a region at or adjacent the face at which the dispersion enters the body to the face from which the coalesced disperse phase leaves the body.

---

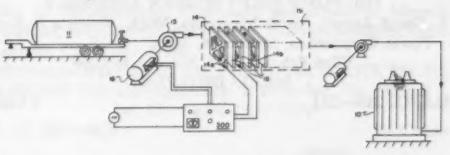
## 4,129,501
## METHOD AND APPARATUS FOR DETECTING WATER IN OIL

**Edward M. Haynes, Box 197, Clifton Forge, Va. 24422**

**Filed Sep. 7, 1977, Ser. No. 831,164**

**Int. Cl.² B01D *13/00***

**U.S. Cl. 210—23 R** **7 Claims**



1. A method of charging electric power transmission equipment with dielectric oil comprising the steps of providing a flow conduit between a reservoir of said oil and said equipment, providing a full-flow, hydrophilic filter within said conduit and motor driven pump means to induce flow of said oil through said filter, the improvement comprising the steps of:

A. Disposing within said conduit, downstream of said filter, water sensing means comprising a pair of electrodes separated by hydrophilic insulating means, said electrodes intimately contacting said insulating means;

B. Charging an electric potential across said electrodes of insufficient strength to conduct past said insulating means in the absence of water permeation thereof;

C. Sensing the presence of current flow past said insulating means in the event of water permeation thereof;

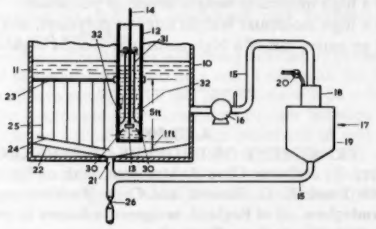
D. Initiating an actuating signal in response to said current flow;

E. Inactivating said pump motor means in response to said actuating signal.

## 4,129,502
## LIQUID TREATMENT PROCESS

Michael E. Garrett, 92 York Rd., Woking, Surrey, and Richard M. Keene, 27 Commonfield Rd., Banstead, Surrey, both of England

Filed Mar. 8, 1977, Ser. No. 775,627
Claims priority, application United Kingdom, Mar. 12, 1976, 10020/76; Apr. 20, 1976, 15956/76
Int. Cl.[2] C02C 5/04
U.S. Cl. 210—60 11 Claims



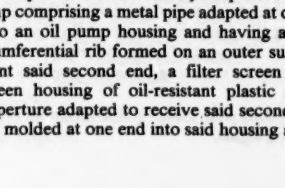
1. A process for treating liquid, which process comprises passing a stream of the liquid under pressure through a line, introducing gas into the stream to form bubbles of gas in the liquid, passing the stream of liquid and gas bubbles downwardly through an expansion chamber in which the velocity of the liquid stream is reduced to a value which allows a prolonged contact time between the gas and liquid while allowing the larger bubbles of gas to rise in the chamber, the stream being introduced into the chamber so as to create sufficient turbulence within the chamber to shatter some of the larger bubbles in the stream into relatively smaller bubbles, passing the stream containing liquid, dissolved gas and possibly relatively small bubbles of undissolved gas into a lower settling zone of a container for the liquid, said expansion chamber being located outside said container, and controlling the pH of the liquid in the container to a value in a predetermined range by injecting a stripping gas to strip unwanted gases from the liquid in the container.

---

## 4,129,503
## OIL PUMP INLET SCREEN ASSEMBLY

A. David Joseph, North Muskegon, Mich., assignor to Sealed Power Corporation, Muskegon, Mich.

Filed Feb. 28, 1978, Ser. No. 882,269
Int. Cl.[2] B01D 25/04
U.S. Cl. 210—232 2 Claims



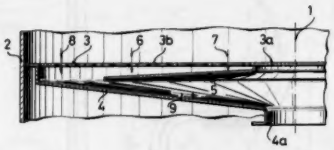
1. An oil pump inlet screen assembly adapted to be immersed in an oil sump comprising a metal pipe adapted at one end to be connected to an oil pump housing and having a second end with a circumferential rib formed on an outer surface of said pipe adjacent said second end, a filter screen including a molded screen housing of oil-resistant plastic construction having an aperture adapted to receive said second pipe end, a metal eyelet molded at one end into said housing and having a second end embracing said rib, and an annular resilient sealing ring surrounding said pipe and captured by said eyelet in compression between said rib and said housing.

---

## 4,129,504
## VAT FOR SEPARATING WORT FOR SPENT GRAIN

Alfons Wolfseder; Hans Urban, both of Freising, and Simon Redl, Reichertshausen, all of Germany, assignors to Anton Steinecker Maschinenfabrik GmbH, Freising, Germany

Filed Feb. 4, 1977, Ser. No. 765,818
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1976, 2607562
Int. Cl.[2] C02C 1/14
U.S. Cl. 210—247 1 Claim



1. A refining vat for the separation of wort from spent grain, having a substantially cylindrical side wall, and apparatus for controlling the draining of the wort from the spent grain so as to cause the wort to leach with substantial uniformity the layer of grain in the vat, said apparatus consisting of:

(a) a flat sieve base in the vat, having a central portion which is impervious to fluids,

(b) an intermediate base which has a slightly outwardly inclined, flattened frusto-conical shape and has its upper edge joined to the outer edge of said central impervious portion of the sieve base, the diameter of said intermediate base being from 0.6 to 0.8 times the inner diameter of said cylindrical side wall, to cause the wort to leach with substantial uniformity the layer of grain which lies on said sieve base and is surrounded by said substantially cylindrical wall, and

(c) a discharge base below the intermediate base, which is inwardly inclined in funnel form and has a central drain hole, to cause the wort to flow down the discharge base and directly into said drain hole.

---

## 4,129,505
## ANTI-STATIC SPRAY AND METHOD OF USE

George F. Dasher, Inverness, and August E. Fiebig, Jr., Chicago, both of Ill., assignors to Alberto-Culver Company, Melrose Park, Ill.

Continuation-in-part of Ser. No. 725,361, Sep. 22, 1976, abandoned. This application Mar. 6, 1978, Ser. No. 883,723
Int. Cl.[2] D06M 13/46
U.S. Cl. 252—8.8 7 Claims

1. An anti-static spray, comprising: a volatile aqueous ethanol solvent carrier composed essentially of from 2 to 10% by weight water and from 90 to 98% ethanol; and a combination of two anti-static agents dissolved in said carrier, one of said agents comprising a quaternary ammonium fabric softener present in an amount of from 0.5 to 2.0% by weight based on the carrier and the other agent being ammonium acetate, said ammonium acetate being present in an amount of from 0.05 to 0.5 parts by weight per part of said quaternary fabric softener.

## 4,129,506
## FABRIC SOFTENERS

**Karl H. Wallhäusser; Ulrich Cuntze; Adolf May, all of Hofheim, and Hans-Walter Bücking, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

**Filed Aug. 31, 1976, Ser. No. 719,114**

**Claims priority, application Fed. Rep. of Germany, Sep. 4, 1975, 2539349**

**Int. Cl.**[2] **D06M** *13/40, 13/46*

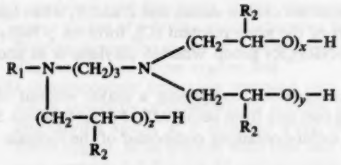
**U.S. Cl. 252—8.8** **6 Claims**

1. Fabric softening compositions having germ-inhibitive properties in the form of liquid, aqueous dispersions, consisting essentially of

(a) 1 to 15% by weight of a condensation product of 1 to 1.5 mols of fatty acid or of a fatty acid ester of the formula I

$$R—CO_2X \quad (I)$$

in which R is an aliphatic radical having about 11 to 21 carbon atoms and X is hydrogen, methyl or ethyl, and 1 mol of an alkylpropylenediaminoxalkylate of the formula II



(II)

in which $R_1$ is an aliphatic radical having 12 to 22 carbon atoms and $R_2$ is hydrogen or methyl and x, y and z are 0 or 1, the sum of x, y and z being 1 to 2; and

(b) 1 to 6% by weight of a cationic disinfectant.

---

## 4,129,507
## SPIN FINISH FOR POLYAMIDE YARN

**Robert M. Marshall; Sung K. Pak, both of Chester, and Kimon C. Dardoufas, Richmond, all of Va., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.**

**Filed Jan. 18, 1978, Ser. No. 870,306**

**Int. Cl.**[2] **D06M** *13/10*

**U.S. Cl. 252—8.9** **10 Claims**

1. A spin finish particularly for continuous filament polyamide yarn to be processed into twist plied tire cord, said finish being an oil in water emulsion of about 10 to 25 percent by weight of said oil portion, said oil portion consisting essentially of 5 to 10 parts by weight of an oxidized polyethylene wax having an average molecular weight between about 1,000 and about 3,000 and containing 3 to 9 percent of oxygen by weight; 30 to 60 parts by weight of white mineral oil having a viscosity of 300 to 500 S.U.S. at 100° F.; 25 to 50 parts by weight of a polyoxyethylene oleyl phosphate; and 2 to 10 parts by weight of a sulfonated succinic acid ester of decyl alcohol, said oil in water emulsion being adjusted to pH 7.1 to 8.0 with sodium hydroxide.

---

## 4,129,508
## DEMULSIFIER ADDITIVE COMPOSITIONS FOR LUBRICANTS AND FUELS AND CONCENTRATES CONTAINING THE SAME

**Edward J. Frilhauf, Mentor, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio**

**Continuation-in-part of Ser. No. 841,617, Oct. 13, 1977, abandoned. This application Apr. 24, 1978, Ser. No. 899,037**

**Int. Cl.**[2] **C10M** *1/40, 3/34;* **C09K** *50/00;* **C10L** *1/32*

**U.S. Cl. 252—33** **33 Claims**

1. A lubricant composition comprising a major proportion of a lubricating oil and a minor proportion of at least one demulsifier additive comprising the mixture of:

(A) one or more reaction products of a hydrocarbon-substituted succinic acid or anhydride with one or more polyalkylene glycols or mono-ethers thereof, wherein said hydrocarbon substituent is an alkyl or alkenyl radical having from 4 to about 50 carbon atoms,

(B) one or more organic basic metal salts, and

(C) one or more alkoxylated amines.

14. In an automatic transmission fluid having a major proportion of lubricating oil and minor proportion of one or more additives including seal swellers, viscosity modifiers, dispersants, detergents, extreme pressure agents and anti-wear agents, anti-rust agents and corrosion inhibitors, the improvement which comprises incorporating into said fluid at least one demulsifier additive comprising the mixture of:

(A) one or more reaction products of a hydrocarbon-substituted succinic acid or anhydride with one or more polyalkylene glycols or mono-ethers thereof, wherein the hydrocarbon substituent on said acid or anhydride is an alkyl or alkenyl radical having about 6 to about 30 carbon atoms, and said polyalkylene glycols have an average molecular weight of about 200 to 1500,

(B) one or more organic basic alkaline earth metal salts, and

(C) one or more amines characterized by having at least one group of the formula $—NR_1R_2$ wherein $R_1$ is $-(O\text{-alkylene})_nOH$ wherein alkylene contains up to 6 carbon atoms, and n is a number of 1 to about 10, and $R_2$ is selected from hydrogen, alkyl of up to about 18 carbon atoms, and $R_1$.

33. A fuel composition having demulsified properties resulting from the incorporation of 1 to 200 parts per million based on the fuel of a demulsifier additive comprising the mixture of:

(A) one or more reaction products of a hydrocarbon-substituted succinic acid or anhydride with one or more polyalkylene glycols or mono-ethers thereof, wherein said hydrocarbon substituent is an alkyl or alkenyl radical having from 4 to about 50 carbon atoms,

(B) one or more organic basic metal salts, and

(C) one or more alkoxylated amines.

---

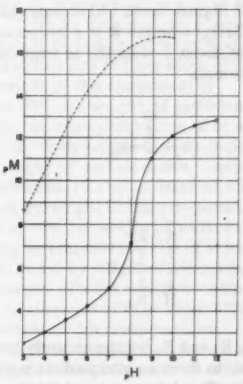
## 4,129,509
## METALWORKING FLUID COMPOSITIONS AND METHODS OF STABILIZING SAME

**Sudhir K. Shringarpurey, Cincinnati, and Gerald L. Maurer, Fairfield, both of Ohio, assignors to National Research Laboratories, Cincinnati, Ohio**

**Continuation-in-part of Ser. No. 597,756, Jul. 21, 1975, Pat. No. 4,055,655. This application Sep. 1, 1976, Ser. No. 719,813**

**Int. Cl.**[2] **C10M** *1/04, 3/04*

**U.S. Cl. 252—49.5** **24 Claims**




3. A stabilized metalworking fluid composition comprising

an oil and water dispersion and, an emulsifying agent selected from the group of anionic and nonionic agents, and mixtures thereof, which imparts an electronegativity to the oil phase of the dispersion, and as a stabilizer therefor in an effective stabilizing amount, a metal complex of a heavy metal ion and a polyfunctional organic ligand, in a ratio of 1:1 of the metal ion to the ligand, said ligand selected from the group of an organic acid and a substituted organic acid, said complex having an aqueous proton induced dissociation property represented by a sigmoidally shaped curve on a cartesian coordinate plot of the negative log of the metal ion concentration versus the negative log of hydrogen ion concentration, said dissociation property causing the controlled release of metal ion to impart stability to the dispersion.

---

**4,129,510**

## SULFUR-CONTAINING COMPOUNDS AND LUBRICANTS AND FUELS CONTAINING THEM

**Donald M. Smith, Euclid, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio**

**Filed Apr. 28, 1976, Ser. No. 681,107**
**Int. Cl.[2] C10M *1/38***
**U.S. Cl. 252—48.6** **36 Claims**

**1**. A process comprising first reacting, in the presence of a catalytic amount of an acid selected from the group consisting of mineral acids and organic acids, (A) at least one mercaptan of the formula $R\text{-}(SH)_m$, wherein R is a hydrocarbyl radical and m' is from 1 to about 5 with (B) at least one carbonyl compound of the formula

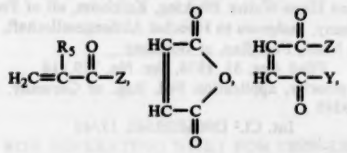
wherein $R_8$ is

and each of $R_1$, $R_2$, $R_3$ and $R_4$ is independently hydrogen or a hydrocarbyl radical, to form an intermediate which is subsequently reacted with (C) at least one olefinic carboxylic acid or functional derivative thereof.

**6**. A process comprising first reacting, in the presence of a catalytic amount of an acid selected from the group consisting of mineral acids and organic acids, (A) at least one mercaptan of the formula $R\text{-}(SH)_{m'}$ wherein R is a hydrocarbyl radical and m' is from 1 to about 5 with (B) at least one carbonyl compound of the formula

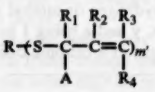
wherein $R_8$ is

and each of $R_1$, $R_2$, $R_3$ and $R_4$ is independently hydrogen or a hydrocarbyl radical, to form an intermediate which is subsequently reacted with (C) at least one member selected from the group consisting of

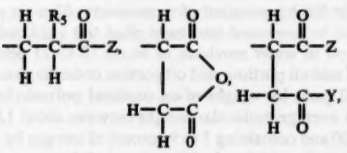


and mixtures of two or more of any of these wherein $R_5$ is hydrogen or a lower alkyl radical and each of Z and Y is independently a member selected from the group consisting of halo, $—OR_6$, —OM, $—O(Alkylene\text{-}O)_n—R_6$, $—N(R_7)_2$, $—NR_7(Alkylene\text{-}NR_7)_nR_7$, $—ON(R_7)_4$, and $—ON(R_7)_3(Alkylene\text{-}NR_7)_nR_7$, wherein n has an average value of about one to about ten, M is a metal cation wherein the metal is selected from the group consisting of Group Ia, Ib, IIa, IIb, IVa, IVb, Va, Vb, VIa, VIb, VIIb, VIII of the periodic table; each $R_6$ is independently hydrogen or a hydrocarbyl radical; each $R_7$ is independently hydrogen, a hydrocarbyl radical or a hydroxy-substituted hydrocarbyl radical; the alkylene group has from about one to about ten carbon atoms, and Z and Y, when taken together as part of the same reactant (C), form an $>N\text{-}R_7$ or $>N\text{-}(Alkylene\text{-}NR_7)_nR_7$ group wherein alkylene is as above defined.

**30**. A fuel composition comprising a major amount of a normally liquid fuel and from about 0.0003% up to about 5% of at least one sulfur-containing compound of the formula



wherein R is a hydrocarbyl radical; each of $R_1$, $R_2$, $R_3$ and $R_4$ is independently hydrogen or a hydrocarbyl radical; m' is from 1 to about 5; and each A is a member selected from the group of



wherein $R_5$ is hydrogen or a lower alkyl radical and each of Z and Y is independently a member selected from the group of halo, $—OR_6$, —OM, $—O(Alkylene\text{-}O)_n—R_6$, $—N(R_7)_2$, $—NR_7(Alkylene\text{-}NR_7)_nR_7$, $—ON(R_7)_4$, and $—ON(R_7)_3(Alkylene\text{-}NR_7)_n—R_7$, wherein n has an average value of about one to about ten; M is a metal cation, wherein the metal is selected from the group consisting of Group Ia, Ib, IIa, IIb, IVa, IVb, Va, Vb, VIa, VIb, VIIb, VIII of the periodic table, each $R_6$ is independently hydrogen or a hydrocarbyl radical; each $R_7$ is independently hydrogen, a hydrocarbyl radical or a hydroxy-substituted hydrocarbyl radical; each Alkylene group independently has from one to about 10 carbon atoms; and Z and Y, when taken together as part of a single A group, form an

$>N\text{-}R_7$ or $>N\text{-}(Alkylene\text{-}NR_7)_nR_7$

group.

## 4,129,511
## METHOD OF SPRAY DRYING DETERGENTS CONTAINING ALUMINOSILICATES

**Toshiaki Ogoshi, Funabashi; Masayoshi Nakamura, Koshigaya, and Izumi Yamane, Yokohma, all of Japan, assignors to The Lion Fat & Oil Co., Ltd., Tokyo, Japan**

**Filed Sep. 19, 1977, Ser. No. 834,302**

**Claims priority, application Japan, Sep. 24, 1976, 51/114459; Oct. 22, 1976, 51/126277; Nov. 5, 1976, 51/132332**

**Int. Cl.[2] C11D** *3/12, 11/02*

**U.S. Cl. 252—140** **6 Claims**

1. A method of manufacturing a granular detergent, which comprises:

(a) preparing an aqueous detergent slurry which contains 15–40% of organic synthetic surface active agent and 5–20% of sodium silicate based on the dry weight of said granular detergent, said detergent slurry having a water content of 35–45 wt.%;

(b) preparing an aqueous aluminosilicate slurry containing fine aluminosilicate particles having a mean particle diameter of not greater than about 5μ and which are substantially free of particles having a particle diameter of at least about 10μ, said aluminosilicate slurry having a water content of 55–80 wt.%;

(c) spraying said detergent slurry downwardly into the upper region of a drying space wherein a hot drying gas is flowing upwardly, at one or a plurality of spraying stages disposed in said upper region; and

(d) simultaneously separately spraying said aluminosilicate slurry upwardly or downwardly into the lower region of said drying space, at a spraying stage disposed in said lower region, in an amount such that said granular detergent contains 0.5–5 wt.% of said aluminosilicate based on the dry weight of said granular detergent, the temperature of said drying gas being lower in said upper region than it is in said lower region.

---

## 4,129,512
## LUBRICATING GREASES

**Alexander W. Kisselow, Hamburg, and Peter K. Wulk, Wedel, Holst, both of Fed. Rep. of Germany, assignors to The British Petroleum Company Limited, Sunbury-on-Thames, England**

**Continuation of Ser. No. 765,375, Feb. 3, 1977, abandoned. This application Feb. 8, 1978, Ser. No. 876,018**

**Claims priority, application Fed. Rep. of Germany, Feb. 5, 1976, 2604342**

**Int. Cl.[2] C10M** *1/32, 3/26, 5/20, 7/30*

**U.S. Cl. 252—51.5 A** **9 Claims**

1. A process for the production of polyurea lubricating greases by the reaction, in a lubricating oil, of

(a) a mono-amino component consisting of a mixture of at least one representative of each of the classes of compounds of general formulae:

$R—NH_2$ and

$R'—NH_2$

in which R is a monovalent aliphatic and R′ is a monovalent aromatic radical,

(b) a diamino component of the general formula:

$NH_2—R—O—R'—O—R''—NH_2$,

in which R, R′ and R″ are divalent aliphatic radicals,

(c) is di-isocyanato component consisting of an aromatic di-isocyanate or a mixture of aromatic di-isocyanates, the two isocyanate groups in the molecules being connected with the same aromatic ring or with different aromatic rings,

characterised in that the diamino component is: 4,17-dioxa-eicosandiamine-1,20

having the formula

$H_2N—(CH_2)_3—O—(CH_2)_{12}—O—(CH_2)_3—NH_2$

---

## 4,129,513
## ELECTRIC FIELD RESPONSIVE FLUIDS

**James E. Stangroom, Castleton, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England**

**Continuation-in-part of Ser. No. 593,494, Jul. 7, 1975, Pat. No. 4,033,892. This application Jan. 21, 1977, Ser. No. 760,977**

**Claims priority, application United Kingdom, Jul. 9, 1974, 30456/74**

**The portion of the term of this patent subsequent to Jul. 5, 1994, has been disclaimed.**

**Int. Cl.[2] C09K** *3/00*

**U.S. Cl. 252—78.1** **12 Claims**

1. An electroviscous fluid composition comprising in dispersion in an electrically non-conducting oleaginous vehicle, a water-containing solid phase, said solid phase consisting essentially of particles of a polymer containing acid groups, having a density of not greater than 1.8 and a water absorbency such that a sample thereof after being allowed to equilibrate with air containing water vapor, loses at least 8% of its weight when heated to constant weight at a temperature which does not cause decomposition of the polymer, and regains at least 40% of this loss in weight when exposed to air at an ambient relative humidity of about 60% and a temperature of 20° C.

---

## 4,129,514
## SURFACE-ACTIVE COMPOSITION BASED ON NON-IONIC SURFACTANTS

**Jean-Claude Caffarel, Decines; Bernard Papillon, La Mulatiere, and Jean Neel, Lyons, all of France, assignors to Rhone-Poulenc Industries, Paris, France**

**Filed Mar. 15, 1977, Ser. No. 777,848**

**Claims priority, application France, Mar. 24, 1976, 7608529**

**Int. Cl.[2] C11D** *1/825, 1/72*

**U.S. Cl. 252—89 R** **10 Claims**

1. Non-ionic surface active composition useful for washing and degreasing containing a mixture of:

(a) at least one non-ionic surface-active compound A of general formula: $R—(OCH_2CH_2)_nOH$ in which R is a $C_6$ to $C_9$ alkyl group and n is greater than 6 and up to 15 and,

(b) at least one non-ionic surface-active compound B of the general formula: $R'—(OCH_2CH_2)_mOH$ in which R′ is a $C_{16}$ to $C_{20}$ alkyl group and m is from 6 to 15, and wherein more than half the groups R and R′ taken separately are linear, characterized in that said composition is solid at ambient temperature and in that it includes:

(i) 2 to 70% by weight of surface-active compound A having an ethoxylation rate of at least 64.7% but less than 72.5% by weight of this compound and 98 to 30% by weight of surface-active compound B which has an ethoxylation rate of from about 47% to less than 62.5% by weight of this compound: or

(ii) 2 to 70% by weight of surface-active compound A having an ethoxylation rate of at least 64.7% but less than 72.5% by weight of this compound and 98 to 30% by weight of surface-active compound B having an ethoxylation rate of at least 62.5% and up to about 73.1% by weight of this compound; or

(iii) 10 to 90% by weight of surface-active compound A having an ethoxylation rate of at least 72.5% and up to about 86.6% by weight of this compound and 90 to 10% by weight of surface-active compound B having an ethoxylation rate of from about 47% to less than 62.5% by weight of this compound; or

(iv) 10 to 90% by weight of surface-active compound A having an ethoxylation rate of at least 72.5% and up to about 86.6% by weight of this compound and 90 to 10% by weight of surface-active compound B having an

ethoxylation rate of at least 62.5% and up to about 73.1% by weight of this compound.

---

4,129,515

## HEAVY-DUTY LIQUID DETERGENT AND PROCESS

Gregory S. Foster, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 722,917, Sep. 13, 1976, abandoned, which is a continuation-in-part of Ser. No. 615,270, Sep. 22, 1975, abandoned. This application Feb. 14, 1978, Ser. No. 877,631

Int. Cl.[2] C11D *1/83, 3/26*

U.S. Cl. 252—117 18 Claims

1. In a process for preparing a clear homogeneous heavy-duty liquid detergent composition which contains a surfactant component comprising detersive amounts of both anionic and nonionic surfactants, as well as alkanolamines and magnesium salts, the improvement which comprises:

(a) mixing the surfactant component comprising a detersive amount of an anionic surfactant, or mixtures thereof, in the free acid form, with sufficient magnesium hydroxide to provide a mixture characterized by a solution pH of from about 1 to about 5.5; and

(b) thereafter admixing sufficient alkanolamine with the foregoing mixture to provide a finished composition characterized by a solution pH of from about 6 to about 9.

---

4,129,516

## ENERGY SAVING DETERGENT MANUFACTURE

Donald J. Peterson, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 12, 1976, Ser. No. 731,182

Int. Cl.[2] C11D *9/30, 15/04*

U.S. Cl. 252—122 18 Claims

1. An energy-saving process for adjusting the water content of wet soaps, wet non-soap detersive surfactants, or wet crutcher mixes to a lower total water content by adding thereto a quantity of a drying agent which comprises a soap having a low water content which is prepared by saponifying carboxylic acid esters with alkali metal hydroxides in a reaction medium which comprises an alkyl nitrile.

---

4,129,517

## AQUEOUS PEROXY-CONTAINING CONCENTRATE

Heinz Eggensperger, Hamburg, and Wolfgang Beilfuss, Hamburg-Hummelsbüttel, both of Germany, assignors to Sterling Drug Inc., New York, N.Y.

Filed Nov. 28, 1977, Ser. No. 855,461

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1976, 2654164

Int. Cl.[2] C11D *3/395, 7/18;* A61K *33/40;* C11D *7/54*

U.S. Cl. 252—186 3 Claims

1. A stable, aqueous peroxy-containing concentrate consisting essentially of by weight of the concentrate:

(a) about 1 to 60 percent of perglutaric acid;

(b) about 1 to about 50 percent of hydrogen peroxide;

(c) about 0.01 to about 2 percent of a stabilizing agent for the perglutaric acid and the hydrogen peroxide;

and (d) the remainder to 100 percent water.

4,129,518

## METHOD FOR CONDITIONING METALLIC WASTE SHELLS MADE OF ZIRCONIUM OR ZIRCONIUM ALLOYS

Karl-Ludwig Huppert, Neuthard, and Dieter Fang, Karlsruhe, both of Fed. Rep. of Germany, assignors to Gesellschaft zur Wiederaufarbeitung von Kernbrennstoffen mbH, Eggenstein-Leopoldshafen, Fed. Rep. of Germany

Filed Mar. 28, 1977, Ser. No. 782,088

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1976, 2613537

Int. Cl.[2] G21F *9/30*

U.S. Cl. 252—301.1 W 13 Claims

1. Method for conditioning metallic waste shells of zirconium or zirconium alloys obtained during processing of irradiated nuclear reactor fuel elements for noncontaminating final storage, comprising subjecting the waste shells to a controlled oxidation at increased temperature in a reaction furnace to produce noncombustible, stable waste products which consist essentially of zirconium dioxide, and bringing the noncombustible waste products so-produced to final storage.

---

4,129,519

## THERMO-LUMINESCENT MATERIAL

Takashi Matsuzawa, Tokyo, Japan, assignor to Nemoto Tokusho Kagaku Kabushiki Kaisha, Japan

Filed Jun. 24, 1977, Ser. No. 809,778

Claims priority, application Japan, Jun. 29, 1976, 51-772776

Int. Cl.[2] C09K *11/50, 11/44, 11/42, 11/18*

U.S. Cl. 252—301.4 H 2 Claims

1. A thermo-luminescent material which comprises crystals or powdery crystallites of lithium fluoride having present therein (A) activators consisting of from 0.05 to 1.0 mol% of magnesium in combination with at least one element selected from the elemental group consisting of copper, silver, and gold, in amount of 0.05–1.0 mol%, respectively, with respect to the LiF, and (B) sensitizers therefor consisting of at least one element selected from the group consisting of carbon, phosphorus, sulfur, arsenic, selenium and tellurium in amount of 0.1 – 5.0 mol% respectively with respect to the LiF.

---

4,129,520

## SOAP MAKING

Donald J. Peterson, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 12, 1976, Ser. No. 731,183

Int. Cl.[2] C11D *13/00, 15/04*

U.S. Cl. 252—367 16 Claims

1. A process for preparing the alkali metal salts of organic carboxylic acids which comprises saponifying the corresponding organic carboxylic acid ester of the formula RCOOR′ wherein RCOO- is an organic acid substituent and wherein R′ is derived from alcohols or polyols, with an alkali metal hydroxide selected from lithium hydroxide, sodium hydroxide, potassium hydroxide, cesium hydroxide and rubidium hydroxide in a liquid reaction medium comprising a substantially water-free alkyl nitrile of the formula R″CN wherein R″ is selected from linear, branched chain, and cyclic aliphatic substituents; separating said salts from the reaction mixture; and removing excess alkyl nitrile from the salts.

4,129,521

## BRANCHED CHAIN NONYL AND DODECYL ISOMERIC MIXTURES OF 2-(5'-NONYL, OR DODECYL-2'-HYDROXYPHENYL)BENZOTRIAZOLE AS UV STABILIZERS

Albert F. Strobel, Delmar, N.Y., assignor to GAF Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 500,083, Aug. 23, 1974, Pat. No. 3,983,132. This application Sep. 28, 1976, Ser. No. 727,428
The portion of the term of this patent subsequent to Sep. 28, 1993, has been disclaimed.
Int. Cl.[2] C09K *15/22*
U.S. Cl. 252—403 8 Claims

1. A normally liquid composition for stabilizing heat and light sensitive materials consisting essentially of branched-chain isomers of hydroxyphenyl benzotriazoles selected from the group consisting of a branched chain dodecyl isomeric mixture of 2-(5'-dodecyl-2'-hydroxyphenyl) benzotriazoles and a branched chain nonyl isomeric mixture of 2-(5'-nonyl-2'-hyroxyphenyl) benzotriazoles.

---

4,129,522

## PREPARATION OF SILICA-ALUMINA MACROSPHERES

Edward Michalko, Chicago, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Nov. 3, 1977, Ser. No. 848,171
Int. Cl.[2] B01J *37/02*
U.S. Cl. 252—453 10 Claims

1. A method of preparing silica-alumina macrospheres which comprises:

(a) acidifying an aqueous alkali metal silicate solution with a strong mineral acid and a weak organic acid, the former being in sufficient concentration to provide an acid anion-/alkali metal ratio of from about 0.75 to about 1.0, and the latter being in sufficient concentration to increase said ratio by a factor of from about 1.3 to about 2;

(b) admixing the acidified solution with an acidic alumina sol and with sufficient urea to effect from about 150 to about 250% neutralization of the acid anion content of the mixture upon total hydrolysis or decomposition of said urea to ammonia;

(c) dispersing the mixture as droplets in a hot oil bath effecting the formation of spheroidal hydrogel particles;

(d) aging the particles in the hot oil;

(e) washing and drying, and calcining the aged spheroidal particles.

---

4,129,523

## CATALYSTS CONTAINING ACTIVE METALLIC COPPER

Paul Snowden, Norton, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Oct. 28, 1976, Ser. No. 736,499
Claims priority, application United Kingdom, Nov. 4, 1976, 45758/76
Int. Cl.[2] B01J *21/04, 23/06, 23/72, 23/26*
U.S. Cl. 252—475 6 Claims

1. A method of making a catalyst containing active metallic copper from a corresponding catalyst precursor containing copper oxide and zinc oxide in which the molar ratio of zinc oxide to copper oxide is 0.5–3:1, which comprises treating at a temperature of 275° C. or less the precursor with a reducing gas mixture containing steam, carbon dioxide or steam and carbon dioxide totaling at least 50% v/v of the mixture and a reducing gas selected from the group consisting of hydrogen, carbon monoxide and compounds that react readily to give hydrogen and/or carbon oxides the content of reducing gas, calculated as equivalent hydrogen, being less than 3% v/v, until a substantial part of the copper oxide has been reduced to metallic copper and thereafter treating it at a temperature of 275° C. or less with a more strongly reducing gas mixture consisting essentially of a reducing gas selected from the group consisting of hydrogen, carbon monoxide and compounds that react readily to give hydrogen and/or carbon oxides and less than 25% by volume of steam, carbon dioxide or carbon dioxide and steam.

---

4,129,524

## RADIATION SHIELDING MATERIAL AND A PROCESS FOR PRODUCING THE SAME

Haruo Nagai; Hiroshi Uehara, both of Nakajo, and Kunikazu Nunokawa, Kurokawa, all of Japan, assignors to Kyowa Gas Chemical Industry Co., Ltd., Tokyo, Japan

Filed Jul. 13, 1977, Ser. No. 815,175
Claims priority, application Japan, Jul. 16, 1976, 51-84617; Jun. 6, 1977, 52-65728
Int. Cl.[2] G21F *1/10*
U.S. Cl. 252—478 34 Claims

1. An optically transparent radiation shielding material of a composition containing

a polymer comprising (A) at least one essential monomer selected from the group consisting of alkyl methacrylate having 1–4 carbon atoms in an alkyl group, hydroxyalkyl acrylate, hydroxyalkyl methacrylate and styrene and (B) lead acrylate or lead methacrylate, and

a lead carboxylate represented by the general formula: $(RCOO)_aPb$, a being an integer equal to the valency of lead and R representing a saturated or unsaturated hydrocarbon residue non-substituted or substituted with a hydroxyl group and having 5–20 carbon atoms, wherein the ratio x (% by weight) of the lead acrylate or the lead methacrylate to the total constituent monomer in the polymer and the compounding ratio y (parts by weight) of the lead carboxylate to 100 parts by weight of said total monomer in said composition satisfy anyone of the following three formulas I, II and III:

$$200 \geqq y \geqq 2, \text{ where } 9 \leqq x \leqq 30 \quad \text{(I)}$$

$$200 \geqq y \geqq 2/5\,(x - 30) + 2, \text{ where } 30 \leqq x \leqq 75 \quad \text{(II) and}$$

$$200 \geqq y \geqq -(9/10)\,(x - 75) + 20, \text{ where } 75 \leqq x \leqq 95 \quad \text{(III).}$$

---

4,129,525

## METHOD OF MAKING LEAD-RICH AND BISMUTH-RICH PYROCHLORE COMPOUNDS USING AN ALKALINE MEDIUM

Harold S. Horowitz, Clark; John M. Longo, New Providence, and Joseph T. Lewandowski, Middlesex, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 2, 1977, Ser. No. 856,648
Int. Cl.[2] C01G *55/00*
U.S. Cl. 252—518 21 Claims

1. A method of preparing compounds having the formula:

$$A_2[B_{2-x}A_x]O_{7-y}$$

wherein A is selected from the group consisting of lead, bismuth and mixtures thereof, wherein B is selected from the group consisting of ruthenium, iridium and mixtures thereof, wherein x is a value such that $0 < x \leqq 1.0$ and y is a value such that $0 \leqq y \leqq 1$, comprising:

reacting A cations and B cations from an aqueous solution source of these cations in a liquid alkaline medium having a pH of at least about 13.5 in the presence of an oxygen source at a temperature below about 200° C. for a sufficient time for reaction to occur.

4,129,526

## GRANULAR DETERGENT COMPOSITIONS AND A PROCESS FOR PRODUCING SAME

Toshiaki Ogoshi, Funabashi; Masayoshi Nakamura, Koshigaya, and Mituyoshi Yazaki, Yachiyo, all of Japan, assignors to The Lion Fat & Oil Co., Ltd., Tokyo, Japan

Filed Jul. 14, 1977, Ser. No. 815,849
Int. Cl.[2] C11D 3/34
U.S. Cl. 252—536 6 Claims

1. A granular detergent composition which consists essentially of:

(a) from 20 to 35% by weight of anionic surfactants are selected from the group consisting of a sodium, potassium or magnesium salt of an α-olefinsulfonic acid, in which the α-olefin moiety has 12 to 20 carbon atoms, a sodium, potassium or magnesium salt of an alkyl ether sulfuric acid, in which the alkyl group has 8 to 18 carbon atoms and the average molar ratio of ethylene oxide is 1 to 5 moles per mole, and a sodium, potassium or magnesium salt of an alkylsulfuric acid, in which the alkyl group has 9 to 16 carbon atoms, from 15 to 50% by weight of the total amount of the anionic surfactants being said α-olefinsulfonic acid salt;

(b) from 10 to 20% by weight of an alkali metal silicate represented by the formula $M_2O.xSiO_2$, where M is an alkali metal and x is a number in the range from 2.5 to 3.6,

(c) from 25 to 60% by weight of an alkali metal carbonate,

(d) from 1 to 20% by weight of an alkali metal salt of a hydroxypolycarboxylic acid, and

(e) not more than 4% by weight of an alkali metal sulfate, said composition being at least substantially free of phosphate.

---

4,129,527

## LIQUID ABRASIVE DETERGENT COMPOSITION AND METHOD FOR PREPARING SAME

Frederick P. Clark, Walnut Creek; Robert C. Johnson, Pleasanton, both of Calif., and John Topolewski, Overland Park, Kans., assignors to The Clorox Company, Oakland, Calif.

Continuation of Ser. No. 521,557, Nov. 7, 1974, abandoned. This application Jun. 21, 1976, Ser. No. 697,961
Int. Cl.[2] C11D 1/17, 1/83
U.S. Cl. 252—547 9 Claims

1. A stable liquid suspension of abrasive particles in an aqueous detergent vehicle, consisting essentially of abrasive particles wherein said abrasive particles are less than 100 mesh size but of sufficient size so as to provide gentle abrasive action suspended in a solution of water and suspension agents consisting essentially of lauryl dimethyl amine oxide, a multiple ionic oxygen containing salt, and an alkylaryl sulfonate detergent, said abrasive particles comprising in the order of about 500 parts by weight per 1,000 parts of the suspension.

9. A stable liquid suspension of abrasive particles of an aqueous detergent vehicle consisting essentially of:

abrasive particles wherein said abrasive particles are less than 100 mesh size but of sufficient size as to provide gentle abrasive action suspended in a solution of water and suspension agents, said suspension agents consisting essentially of:

lauryl dimethyl amine oxide in an amount of from about 12 parts by weight per thousand parts of suspension to about 40 parts by weight per thousand of suspension;

a multiple ionic oxygen containing salt in an amount of from about two parts per thousand parts of the suspension to about thirty parts per thousand part of the suspension; and

an alkylaryl sulfonate detergent, present by weight in an amount of at least 16.5 parts per thousand parts of the suspension,

said abrasive particles comprising in the order of about 500 parts by weight per 1000 parts of the suspension.

4,129,528

## POLYAMINE-EPIHALOHYDRIN RESINOUS REACTION PRODUCTS

John P. Petrovich, Chesterfield, and Donald N. Van Eenam, Des Peres, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed May 11, 1976, Ser. No. 685,227
Int. Cl.[2] C08F 00/00
U.S. Cl. 260—823 8 Claims

1. A method for preparing a resinous composition which comprises:

A. forming an amine prepolymer containing a hydrohalide,

B. removing a substantial amount of the halide ion from the amine prepolymer, and thereafter,

C. contacting the substantially halide-free amine prepolymer with an epihalohydrin.

---

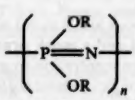
4,129,529

## PROCESS FOR THE PRODUCTION OF PHOSPHAZENE POLYMERS

John W. Fieldhouse, Mogadore; Daniel F. Graves, Akron; William M. Cole, Norton; Mark L. Stayer, Suffield, and Steven L. Fenske, Uniontown, all of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Aug. 12, 1977, Ser. No. 824,004
Int. Cl.[2] C08G 79/02, 73/00
U.S. Cl. 528—168 8 Claims

1. In a process for producing alkoxy and/or aryloxy polyphosphazene esters represented by the general formula



wherein each OR represents at least one alkoxy or aryloxy group including groups with either saturated or unsaturated substituents and not all of the OR groups are required to be the same, and n is an integer of between about 7 and about 50,000 or more;

wherein a solution of a linear dihalophosphazene represented by the formula $(NPHal_2)_n$ wherein Hal represents a halogen selected from the group consisting of Cl and Br an n is an integer greater than about 7; is reacted with a solution of an alkoxide or aryloxide represented by the formula $M(OR)_x$ in which M represents a metal selected from the group consisting of the alkali and alkaline earth metals and x is the valence of M;

and a solution of the desired ester is produced along with $M(Hal)_x$ as a by-product of the reaction;

the improvement which comprises providing a single common solvent for (1) said linear dihalophosphazene; (2) said alkoxide or aryloxide; and (3) said polyphosphazene ester; whereby the reaction is carried out in a homogeneous system and complete replacement of the P-Hal atoms is more readily effected than in a heterogeneous system in which a plurality of different solvents are utilized in said solutions.

---

4,129,530

## SOFT ETHYLENIC POLYMER FOAMS

Chung P. Park, Pickerington; John M. Corbett, Newark, both of Ohio, and Warren H. Griffin, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 763,269, Jan. 27, 1977, abandoned, which is a continuation-in-part of Ser. No. 708,447, Jul. 23, 1976, abandoned. This application Dec. 19, 1977, Ser. No. 861,938
Int. Cl.[2] C08J 9/14
U.S. Cl. 521—79 14 Claims

1. A method for making soft ethylenic polymer resin foams

having substantially closed cell structure, dimensional stability, and thickness greater than about 0.5 inch from starting ethylenic polymer resins which have low stiffness less than about 20,000 psi and which comprise low stiffness copolymers of ethylene which copolymers consist essentially of ethylene and monoethylenically unsaturated non-ionic comonomers, by forming under heat and pressure a flowable gel composition of the starting polymer resin and a volatile blowing agent and releasing the resulting flowable gel to ambient air atmosphere whereby the blowing agent separates from the gel and forms gas bubbles in the polymer resin, particularly characterized in that the volatile blowing agent is composed of a mixture of dichlorodifluoromethane and an essential constituent A which is at least one fluorocarbon which has normal boiling point between −40° and 5° C. and a value for the critical quantity $T_b$-0.5$V_c$ of not greater than 110, where $T_b$ is the normal boiling point temperature of the fluorocarbon in degrees Kelvin and $V_c$ is its critical volume in cubic centimeters per gram-mole, the mixed blowing agent containing, per 100 parts by weight, from about 35 to about 50 parts of fluorocarbon constituent A and at least about 75 parts of total fluorocarbon mixture of dichlorodifluoromethane and constituent A and there being up to about 0.18 gram-mole of such mixed blowing agent per 100 grams of polymer resin in the flowable gel.

---

**4,129,531**

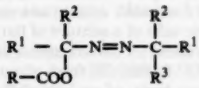
## CROSSLINKING OF POLYMERS WITH AZO-ESTERS

**Kurt Rauer; Harald Hofmann, both of Guenzburg; Heidelinde Schiller, Norderstedt, all of Fed. Rep. of Germany, and Chester S. Sheppard, Kenmore, N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.**

**Filed Dec. 14, 1977, Ser. No. 860,353**
**Int. Cl.² C08J 9/10**
**U.S. Cl. 521—94** **7 Claims**

1. The process of crosslinking or simultaneously cross-linking and foaming a polymer selected from the group consisting of polyethylene, ethylene-vinyl acetate copolymer, ethylene-propylene copolymer, ethylene-propylene-diene terpolymer, styrene-butadiene rubber, acrylonitrile-butadiene-styrene rubber, ethylene-propylene-ethylidene-norbornene rubber, and polybutadiene rubber comprising:

(a) mixing with 100 parts by weight of said polymer 0.5 to 20% by weight of a composition including at least one azo-ester cross-linking and foaming agent of the formula:



(I)

in which

R is selected from the group consisting of H, lower alkyl, cycloalkyl, aryl and aralkyl;

$R^1$ and $R^2$ are independently selected from the group consisting of alkyl, cycloalkyl, aryl and aralkyl wherein each of the groups may have alkyl branching;

$R^1$ and $R^2$ can join together to form $R^1R^2$ group where the group is selected from —$(CH_2)_4$—, —$(CH_2)_5$—, alkylsubstituted tetramethylene or alkyl-substituted pentamethylene;

R and $R^1$ can join together to form $RR^1$ group where the group is selected from —$(CH_2)_2$—, —$(CH_2)_3$—, alkylsubstituted —$(CH_2)_2$— or alkylsubstituted —$(CH_2)_3$—; and

$R^3$ is selected from the group consisting of —OOC—R, alkyl, cycloalkyl and aralkyl; and

(b) in the absence of an activator which lowers the decomposition temperature of the cross-linking and foaming agent when the composition is heated, heating the polymer mixture at a temperature above 170° C. but not to the point where the polymer will substantially degrade and a pressure of 0 to 300 psia until cross-linking or crosslinking and foaming are effected.

---

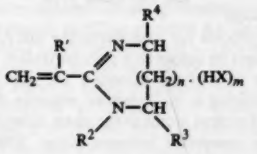
**4,129,532**

## METHOD OF PREPARING IMIDOZOLINE AND TETRAHYDRO PYRIMIDINE POLYMERS

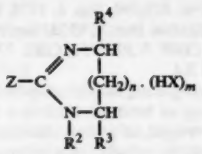
**Hans P. Panzer, Stamford; Michael N. D. O'Connor, Norwalk, and Louis J. Baccei, Newington, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.**

**Division of Ser. No. 643,729, Dec. 22, 1975, which is a division of Ser. No. 467,331, May 6, 1974, Pat. No. 4,006,247. This application Jul. 13, 1977, Ser. No. 815,339**
**Int. Cl.² C08F 126/06**
**U.S. Cl. 526—75** **7 Claims**

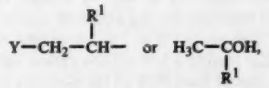
1. A method for the production of a homopolymer of a compound having the formula



wherein n is 0 or 1, m is 1, X is an anion, $R^1$ is hydrogen, methyl or phenyl and $R^2$, $R^3$ and $R^4$ are, individually, hydrogen, alkyl ($C_1$–$C_4$), aryl ($C_6$–$C_{10}$), aralkyl ($C_7$–$C_{11}$) or alkaryl ($C_7$–$C_{11}$), said homopolymer being colorless and free of non-amidine imino, carboxyl, ester and amide groups, unreacted nitrile groups and unreacted polyamine, which comprises melt cracking a compound having the formula



wherein Z is



wherein Y is hydroxyl or RO, R being alkyl ($C_1$–$C_{10}$), aryl ($C_6$–$C_{10}$) or aralkyl ($C_7$–$C_{11}$), and $R^1$–$R^4$, n, m and X are as defined above, at a temperature ranging from about 150° C. to about 500° C. and recovering the resultant polymer.

---

**4,129,533**

## PROCESS FOR PRODUCING STABILIZED HIGH STRENGTH UREA-ALDEHYDE INSULATING FOAMS

**William P. Moore, Jr., Hopewell, Va., assignor to Ashland Oil, Inc., Ashland, Ky.**

**Division of Ser. No. 836,492, Sep. 26, 1977, Pat. No. 4,097,419. This application Dec. 16, 1977, Ser. No. 861,170**
**Int. Cl.² C08J 9/30, 9/12**
**U.S. Cl. 521—117** **4 Claims**

1. An improved process for producing stable urea-aldehyde insulating foams having properties of improved structural strength and low formaldehyde vapor emission, from two separate storable liquids, said process comprising: blending an air-foamed solution containing dialdehydes having two to eight molecular carbons, surfactant, and mineral acid, with a partially cured aqueous urea-formaldehyde resin containing between 1.3 and 1.5 mols of formaldehyde per mol of urea and

about 50 percent total solids, so that the molecular aldehyde moieties supplied by the dialdehyde are between 0.2 and 0.4 times the number of aldehyde moieties supplied by formaldehyde, and the molecular ratio of total aldehyde moieties to urea is between 1.7 and 2.0; curing and drying the blended fluids at a pH between 2.0 and 3.5 at ambient conditions until the foam hardens.

---

4,129,534

## POLY(DIMETHYLAMINOETHYL METHACRYLATE) AND METHOD OF PREPARATION

Virginia L. Cunningham, Hatboro, Pa., assignor to Rohm and Haas Company, Del.

Division of Ser. No. 630,477, Nov. 10, 1975, Pat. No. 4,052,343. This application Aug. 11, 1977, Ser. No. 823,569

Int. Cl.[2] C08F 2/18

U.S. Cl. 521—38 2 Claims

1. In the process for manufacturing macroreticular crosslinked polymers by suspension polymerization of monomers in the presence of a phase extender, the improvement which comprises utilizing a trialkylamine wherein the alkyl groups contain 2 to 8 carbon atoms as the phase extender, wherein the trialkylamine comprises between about 20% and 80% by weight of the total organic mixture.

---

4,129,535

## FIRE RETARDANT POLYVINYL CHLORIDE CONTAINING COMPOSITIONS

Robert G. Elcik, Mount Holly, N.J., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 502,590, Sep. 3, 1974, Pat. No. 3,983,290. This application Dec. 8, 1975, Ser. No. 638,734

Int. Cl.[2] C08K 5/10, 5/51; C08L 27/06, 91/00

U.S. Cl. 260—23 XA 13 Claims

1. A film forming composition adapted for use in a vapor barrier comprising an intimate admixture of: (1) from about 40% to 55%, by weight, of a vinyl chloride polymer; (2) from about 7% to 20%, by weight, of a chlorinated polyethylene having a chlorine content of from about 35% to about 45%; (3) from about 4% to 20%, by weight, of a phosphate ester plasticizer; (4) from about 3% to 6%, by weight, of an antimony trioxide flame retardant having a particle size of below about 5 microns; (5) from about 3% to 7%, by weight, of a magnesium hydroxide filler having a low oil absorption value and a particle size such that at least 99% of the particles have a diameter of less than 45 microns and, (6) from about 3% to 6%, by weight, of zinc borate.

---

4,129,536

## VINYL CHLORIDE BASED INJECTION MOLDING COMPOSITION

Carl J. Martin, Indianapolis, and Robert J. Ryan, Zionsville, both of Ind., assignors to RCA Corporation, New York, N.Y.

Filed Jul. 25, 1977, Ser. No. 818,280

Int. Cl.[2] C08F 15/00, 114/02; G11B 3/44

U.S. Cl. 260—23 XA 2 Claims

1. An injection molding composition comprising a vinyl chloride-propylene copolymer containing about 6–8 percent by weight of propylene; from about 1–3 percent by weight of the molding composition of a solid mercapto tin stabilizer; from about 1–3 percent by weight of the molding composition of an acrylic resin processing aid; and a mixture of from about 0.25–1 percent by weight of the molding composition of an ester wax of a monofatty acid and alcohol lubricant and from about 0.1–0.5 percent by weight of the molding composition of an ester wax of a polyfunctional acid and alcohol lubricant.

4,129,537

## AIR-DRYING ACRYLATE LACQUER BINDERS

Rolf Dhein, Krefeld, and Lothar Fleiter, Krefeld-Traar, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed Oct. 14, 1977, Ser. No. 842,042

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1976, 2647314

Int. Cl.[2] C09D 3/58, 3/74

U.S. Cl. 260—23 EP 4 Claims

1. An air-drying lacquer binder, comprising a copolymer of average molecular weight from about 3,000 to 20,000, as determined in tetrahydrofuran by the vapor pressure reduction method, comprising copolymerised units of

20 to 55% by weight of styrene,

5 to 30% by weight of glycidyl(meth)acrylate, and

0 to 50% by weight of at least one (meth)acrylic acid ester with 1 to 10 carbon atoms in the alcohol component, which has been esterified with

0 to 15% by weight of at least one natural, drying fatty acid, and

10 to 50% by weight of isomerised drying fatty acids

(the sum of the percentage contents amounting to 22–50% by weight) based on the copolymer and drying fatty acids and dicarboxylic acid anhydride subsequently used, up to an acid number of $< 10$, from 30 to 75% by weight of the isomerised drying fatty acids containing conjugated double bonds, and wherein the hydroxyl groups formed have subsequently been reacted with from 0.5 to 3% by weight, based on the total components of the binder, of tetrahydrophthalic acid anhydride or at least one isomer thereof or a mixture of these anhydrides.

---

4,129,538

## PEPTIZING AGENT FOR NATURAL RUBBER AND SYNTHETIC BUTADIENE-STYRENE RUBBER

Earl Kaplan, Metuchen, and Frank G. Pinto, Martinsville, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed May 20, 1977, Ser. No. 799,047

Int. Cl.[2] C09K 3/00; C08C 4/00

U.S. Cl. 260—23.7 M 12 Claims

1. A peptizing composition for natural rubber and synthetic butadiene-styrene rubber comprising (A) from about 97% to about 99%, by weight, based on the weight of said composition, of a mixture of (1) an iron-free peptizer selected from the group consisting of (a) organic mercaptans, (b) organic disulfides, (c) zinc salts of organic mercaptans and (d) mixtures thereof and (2) the zinc salts of a mixture of fatty acids containing from about 14 to about 20 carbon atoms having a melting point below about 115° C. and (B) from about 1.0% to about 3.0%, by weight, same basis, of an iron phthalocyanine, the weight ratio of (1) to (2) ranging from about 2:1 to about 1:2, respectively.

11. A method for peptizing natural rubber and synthetic butadiene-styrene rubber at from about 70° C. to about 150° C. which comprises incorporating therein from about 0.1 to about 1.0 weight percent of the composition of claim 1.

---

4,129,539

## HOT MELT ADHESIVES FOR CELLULOSIC MATERIAL

Istvan E. Fakla, Glashutten, and Reinhard Grote, Oberursel, both of Fed. Rep. of Germany, assignors to USM Corporation, Farmington, Conn.

Filed Aug. 30, 1977, Ser. No. 829,160

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1976, 2639132

Int. Cl.[2] C08L 31/00

U.S. Cl. 260—27 R 12 Claims

1. A hot melt adhesive composition having a softening point (Ball and Ring) of from about 60° to about 110° C. for application in molten state to form strong, flexible adhesive bonds to

cellulosic material and also capable of being dissolved or dispersed in cold water when disposed as an adhesive layer between cellulosic sheets, said adhesive comprising a polymeric binder material which is insoluble in cold water and which has free carboxylic groups, said binder being selected from the group consisting of a copolymer of vinyl acetate with from about 2% to about 10% of crotonic acid and a colophonium ester of pentaerythritol having an acid number of from about 196 to about 212, characterized in that the composition contains from about 2% to about 10% of an aliphatic amino alcohol reactive in the presence of water with the carboxylic groups of the polymeric material to promote solubility of the polymeric material in cold water.

---

## 4,129,540
## SMOKE RETARDED POLYMER COMPOSITIONS CONTAINING AMINE MOLYBDATES

**William J. Kroenke, Brecksville, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio**

**Continuation-in-part of Ser. No. 770,168, Feb. 14, 1977, Pat. No. 4,053,455. This application Oct. 11, 1977, Ser. No. 841,182**
**Int. Cl.[2] C08K** *5/34, 5/17*
**U.S. Cl. 260—28.5 A** **19 Claims**

1. A smoke retarded composition comprising

(A) a smoke retardant amount of at least one amine molybdate, the amine used in preparing said amine molybdate containing from 1 to 40 carbon atoms and from 1 to 10 primary, secondary or tertiary amine groups or a mixture thereof, and

(B) at least one polymer selected from the group consisting of, polychloroprene, polymonoolefins, halogenated and chlorosulfonated polymonoolefins, poly(vinylacetate), and polymers of acrylonitrile alone or with butadiene and/or styrene.

18. A composition of claim 1 wherein a halogen source is additionally present.

19. A composition of claim 18 wherein said halogen source is a chlorinated paraffin wax.

---

## 4,129,541
## ASPHALTIC COMPOSITIONS CONTAINING CONJUGATED DIENE-MONOVINYL-SUBSTITUTED AROMATIC HYDROCARBON COPOLYMERS OF PARTICULAR STRUCTURES

**Oren L. Marrs, and Robert E. Reusser, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed Oct. 26, 1977, Ser. No. 845,706**
**Int. Cl.[2] C08L** *91/00*
**U.S. Cl. 260—28.5 AS** **12 Claims**

1. An improved composition adapted for coating of an object to be protected such as a pipeline to be laid under the sea, especially in cold water or in a cold climate, and having highly desirable resistance to stress cracking or flexibility at low temperatures of the order of 40° F. (4.4° C.) or lower which comprises asphalt, aggregate, and as desired, a fibrous filler and a conjugated diene/monovinyl aromatic radial teleblock copolymer having been prepared by copolymerizing a conjugated diene having 4 to 8 carbon atoms with a monovinyl-substituted aromatic hydrocarbon having 8 to 12 carbon atoms in presence of an organolithium initiator but in absence of randomizer, or by incremental additionof both monovinyl-substituted aromatic hydrocarbon and initiator, said copolymer having a poly(monovinyl-substituted aromatic hydrocarbon) portion which has a weight average molecular weight of at least 7.5% of the weight average molecular weight of the copolymer, the weight ratio of conjugated diene to vinyl aromatic hydrocarbon is in the approximate range 60–95/40–5, and weight average molecular weight of a copolymer is in the approximate range 70,000–300,000.

## 4,129,542
## THERMOPLASTIC ELASTOMERIC BLEND OF RUBBER AND BITUMINOUS MATERIAL

**Alister F. Matheson, Wilmslow, England; Douglas J. Tosh, Sarnia, and Mitchell Borr, Guelph, both of Canada, assignors to Uniroyal Ltd., Montreal, Canada**

**Continuation of Ser. No. 417,701, Nov. 20, 1973, abandoned. This application Feb. 5, 1976, Ser. No. 655,593**
**Claims priority, application Canada, Nov. 14, 1973, 185784**
**Int. Cl.[2] C08L** *95/00*
**U.S. Cl. 260—28.5 AS** **1 Claim**

1. A method of converting into a thermoplastic elastomer an unsaturated vulcanizable rubber comprising providing an intimately mixed blend of (A) 100 parts by weight of said unsaturated vulcanizable rubber with (B) from 125 to 250 parts by weight of bituminous material by masticating the said unsaturated vulcanizable rubber and bituminous material together at elevated temperature, and further masticating said intimately mixed blend under dynamic shearing conditions in an internal mixer in the presence of (C) a curative for said unsaturated vulcanizable rubber in amount sufficient to cure the rubber, the said dynamic shearing of the intimately mixed blend in the presence of the curative being continued for a time and at a temperature sufficient to dynamically cure the rubber, whereby the bend is converted into a thermoplastic elastomer which is characterized by the ability to be thermoformed thereafter without cure into useful shaped articles having elastomeric properties, and by the ability to be re-processed, the said rubber (A) being ethylene-propylene-non-conjugated diene terpolymer.

---

## 4,129,543
## THERMOSETTING MOLDING RESIN COMPOSITIONS

**Neil Kaplan, Brooklyn, N.Y., assignor to Hi-Tech Industries, Inc., Jamaica, N.Y.**

**Filed Jun. 18, 1976, Ser. No. 697,307**
**Int. Cl.[2] C08K** *5/54*
**U.S. Cl. 260—29.15 B** **17 Claims**

1. In a polymerizable thermosetting liquid resin composition which is designed and adapted for use in an injection molding process, the composition comprising an unsaturated polyester resin capable of cross-linking to form a thermoset polymer and a cross-linking monomer capable of copolymerizing with the polyester resin to form a cross-linked thermoset polymer, and a particulate filler material in an amount of at least about 100 parts per 100 parts by weight of the resin and cross-linking monomer, the improvement comprising a dimethylpolysiloxane, having a viscosity of at least 100 centistokes when measured at 25° C in a Brookfield viscometer, RV series, and converted to centistokes according to the formula

viscosity(centistokes) =
viscosity(centipoise)/density;

dimethylpolysiloxane being present in an amount of from about 0.02 to about 3 parts per 100 parts of the combined resin, whereby the polymerizable resin composition is rendered substantially free of incondensible gases to that voids are not formed in a product injection molded from said polymerizable resin composition.

---

## 4,129,544
## AQUEOUS ACRYLIC COATING COMPOSITION FOR ELECTRICAL CONDUCTORS

**John D. Craig, Medford Lakes, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Continuation-in-part of Ser. No. 681,595, Apr. 29, 1976, abandoned. This application Aug. 24, 1977, Ser. No. 827,234**
**Int. Cl.[2] C08L** *61/10, 33/24*
**U.S. Cl. 260—29.3** **15 Claims**

1. An aqueous coating composition having a solids content of about 5–50% of film forming constituents; wherein the film forming constituents consist essentially of about

(A) 60–95% by weight of a dispersed acrylic polymer consisting essentially of about
(1) 35–55% by weight, based on the weight of the acrylic polymer, of acrylonitrile or methacrylonitrile;
(2) 15–58% by weight, based on the weight of the acrylic polymer, of an alkyl acrylate having 2–12 carbon atoms in the alkyl group;
(3) 2–15% by weight, based on the weight of the acrylic polymer, of methacrylic acid or acrylic acid; and
(4) 5–15% by weight, based on the weight of the acrylic polymer, of an (alkoxymethyl) acrylamide having 1–6 carbon atoms in the alkoxy group;
wherein the acrylic polymer has a weight average molecular weight of at least 150,000; and
(B) 5–40% by weight of a phenol formaldehyde condensate; having a weight average molecular weight of about 100–2000 measured by gel permeation chromatography; wherein the composition contains a sufficient amount of ammonia or an amine to provide a pH of about 7–9.5.

---

**4,129,545**

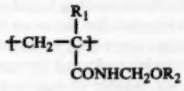
## THERMOSETTING ACRYLIC COPOLYMER USABLE AS A POWDER PAINT AND METHOD FOR PRODUCING THE SAME

**Takashi Sunamori; Koji Matsushima, and Susumu Tanaka, all of Otake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan**

**Continuation-in-part of Ser. No. 759,125, Jan. 13, 1977, abandoned. This application Nov. 8, 1977, Ser. No. 849,559**
**Claims priority, application Japan, Jan. 16, 1976, 51-4447**
**Int. Cl.[2] C08F *24/00, 124/00, 20/10;* C08J *3/12***
**U.S. Cl. 260—29.6 TA** **13 Claims**

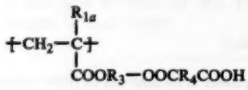
1. A thermosetting acrylic copolymer for the use as powder paint, which comprises

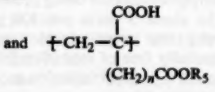
(1) 3 to 30% by weight of at least one repeating unit of the formula (I):


(I)

wherein $R_1$ represents a hydrogen atom or methyl group and $R_2$ represents an alkyl group having 1 to 8 carbon atoms or a cycloalkyl group having 6 to 8 carbon atoms,

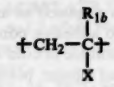
(2) 1 to 50% by weight of at least one repeating unit selected from the groups of the formulae (II) and (III):


(II)


(III)

wherein $R_{1a}$ represents a hydrogen atom or methyl group, $R_3$ represents an alkylene group having 2 to 6 carbon atoms, $R_4$ represents an aliphatic group containing or not containing a carboxyl group and having 2 to 12 carbon atoms or an aromatic group containing or not containing a carboxyl group and having 6 to 12 carbon atoms, $R_5$ represents an aliphatic group containing or not containing a hydroxyl group and having 1 to 18 carbon atoms or an aromatic group containing or not containing a hydroxyl group and having 6 to 18 carbon atoms, and n represents an integer of 1 or 2, and

(3) 20 to 96% by weight of at least one repeating unit of the formula (IV):


(IV)

wherein $R_{1b}$ represents a hydrogen atom or methyl group, and X represents an ester, nitrile, amide, $R_6COO$— in which $R_6$ represents an alkyl group having 1 to 18 carbon atoms, glycidylester, glycidylether or aromatic group having 6 to 18 carbon atoms or a halogen atom, said polymer having a weight average molecular weight of 4,000 to 30,000 and being in a solid state at normal temperature.

---

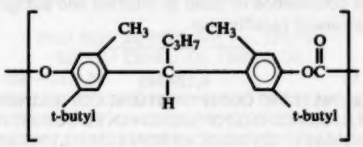
**4,129,546**

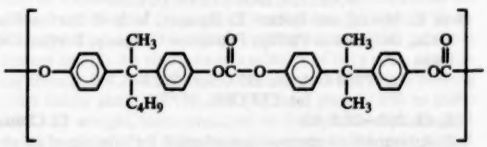
## PLASTICIZED WITH A MINOR AMOUNT OF AN OLIGOMERIC POLYMERIC POLYCARBONATE

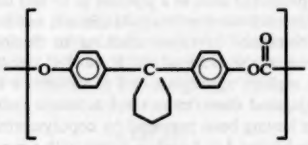
**Robert J. Axelrod, Glenmont, N.Y.; Victor Mark, Evansville, and Phillip S. Wilson, Mt. Vernon, both of Ind., assignors to General Electric Company, Pittsfield, Mass.**

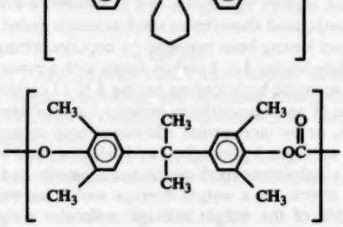
**Filed Dec. 8, 1976, Ser. No. 748,464**
**Int. Cl.[2] C08K *5/11***
**U.S. Cl. 260—31.8 T** **8 Claims**

1. A plasticized polycarbonate composition comprising in admixture a high molecular weight aromatic carbonate polymer and a minor amount of an oligomeric polymeric carbonate selected from the group consisting of those having repeating units of the following formulae:




and wherein said oligomeric polymeric carbonate has an intrinsic viscosity of 0.001 to 0.36 dl./g. as measured in methylene chloride at 25° C.

4,129,547

## HIGH SOLIDS COATING COMPOSITIONS FOR FLEXIBLE SUBSTRATES CONTAINING UREA-FORMALDEHYDE

Paul R. Noyes, Philadelphia, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 30, 1977, Ser. No. 811,983
Int. Cl.[2] C08K 5/05
U.S. Cl. 260—33.4 R 5 Claims

1. A high solids thermosetting coating composition consisting essentially of:

(A) 50–85 parts by weight, based on the weight of (A) plus (B), of a methylated urea-formaldehyde crosslinking agent; and

(B) 50–15 parts by weight, based on the weight of (A) plus (B) of a liquid polyol having a molecular weight range of 425–1,100, selected from the group consisting of aliphatic diols and triols, ether diols and triols, and polyester diols; wherein components (A) and (B) are compatible and wherein the mixture of (A) and (B) has a maximum Brookfield viscosity of 2,000 centipoises at 25° C.; said composition having a minimum solids content of 80% by weight.

---

4,129,548

## HARDENABLE RESIN COMPOSITIONS

Christopher R. S. McDonnell, Harrogate, England, assignor to Metalife Molecular Belzona Limited, North Yorkshire, England

Filed Jul. 5, 1977, Ser. No. 812,755
Int. Cl.[2] C08L 63/00
U.S. Cl. 260—37 M 11 Claims

1. A method of repairing metal parts comprising replacing worn or damaged portions of metal in said parts with a composition comprising a liquid polymerizable resin, ferrosilicon, and a hardener for said resin.

---

4,129,549

## METHOD OF GRAFTING A POLYMER TO FILLER MATERIALS

Lucien Kahane, Villers-sous-Saint Leu, France, assignor to Union Minerale, Villers-sous-Saint Leu, France

Filed Mar. 26, 1976, Ser. No. 670,557
Claims priority, application France, Mar. 27, 1975, 75 09626; Mar. 8, 1976, 76 06508
Int. Cl.[2] C08K 9/04
U.S. Cl. 260—40 R 13 Claims

1. A method of grafting a polymer to an inorganic filler material composed of mineral particles comprising:

(a) fixing a predetermined quantity of a surfactant consisting essentially of a non-ionic substance containing a plurality of —OH functions to the mineral particles of said filler material while keeping free at least one functionally reactive —OH site of said surfactant; and

(b) reacting the product formed in step (a) at a temperature in the range of about from 100° C. to 150° C. with an organic chemical reagent containing at least one carboxyl function capable of esterifying said free at least one functionally reaction —OH site of the surfactant to form, in situ, an organic polymer grafted to the mineral filler.

4,129,550

## SELF-LUBRICATING HEAT-RESISTANT MATERIAL AND PROCESS FOR MANUFACTURING SAME

Nikolai S. Nametkin, Leninsky prospekt, 13, kv. 11; Georgy V. Vinogradov, ulitsa Chernyshevskogo, 41, kv. 26; Jury Y. Podolsky, prospekt Vernadskogo, 81, kv. 70; Nina T. Pavlovskaya, ulitsa Krasikova, 19, kv. 19; Ernest I. Frenkin, Leninsky prospekt, 57, kv. 147, and Jury G. Yanovsky, B. Serpukhovskaya, 48, korpus 1, kv. 11, all of Moscow, U.S.S.R.

Filed Apr. 23, 1975, Ser. No. 570,791
Claims priority, application U.S.S.R., Apr. 24, 1974, 2017551
Int. Cl.[2] C08K 3/04, 3/30, 3/38
U.S. Cl. 260—42.22 5 Claims

1. A self-lubricating heat-resistant material, consisting of from 20 to 90 percent by weight of poly(butadiene) with a degree of cross-linking in the final product of from 30 to 95 percent, and from 10 to 80 percent by weight of an antifriction filler selected from the group consisting of molybdenum disulphide, graphite, boron nitride and a mixture of said compounds.

---

4,129,551

## FLAME RETARDANT POLYESTERS

Jöern Rüeter, and Raban Grundamann, both of Marl, Germany, assignors to Chemische Werke Huels Aktiengesellschaft, Marl, Germany

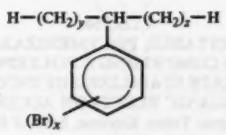
Filed Oct. 8, 1976, Ser. No. 730,954
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1975, 2547498
Int. Cl.[2] C08K 5/53, 5/03
U.S. Cl. 260—45.7 R 10 Claims

1. In a thermoplastic, saturated linear polyester molding composition rendered nonflammable by the presence therein of

(a) 0.1–2% by weight of phosphorus provided by an organic, oxygen-containing phosphorus compound; and

(b) 1–5% by weight of bromine provided by a ring-brominated aromatic compound,

the improvement wherein the phosphorus compound of (a) is triphenylphosphine oxide and the bromine compound of (b) is a compound of the formula




wherein x is an integer from 2 to 5, y and z each are 0 or an integer from 1 to 17, and the sum of y + z is an integer between 7 and 17, or a mixture thereof.

---

4,129,552

## INSULATION MATERIAL FOR HIGH VOLTAGE ELECTRIC POWER CABLE

Stanislas Galaj, Arcueil; Bernard Hochon, La Garenne Colombes, and Pierre Lerner, Villebon sur Yvette, all of France, assignors to Compagnie General d'Electricite S.A., Paris, France

Filed Feb. 28, 1977, Ser. No. 772,881
Claims priority, application France, Mar. 10, 1976, 76 06812
Int. Cl.[2] C08L 23/06; C08F 6/00, 110/02; C08K 5/18
U.S. Cl. 260—45.9 QB 8 Claims

1. Insulation material for a high voltage electric power distribution cable, consisting essentially of low density extrudible polyethylene having a density of less than 0.930 and a concentration of low molecular weight polyethylene capable of being removed by washing the polyethylene with diethyl oxide or ethanol solvent over a period of several hours by bringing the polyethylene into contact with the solvent in vapor form in counter flow at a temperature slightly above its dew point in a flow of inert gas and shaded from light which is less than 600 parts per million be weight.

**4,129,553**

## ORGANIC PHOSPHITES AND THEIR USE AS STABILIZERS

**Harald Häberlein; Herbert Nies, and Franz Scheidl, all of Gersthofen, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

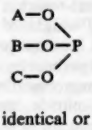
**Filed May 23, 1977, Ser. No. 799,277**

**Claims priority, application Fed. Rep. of Germany, May 28, 1976, 2623985**

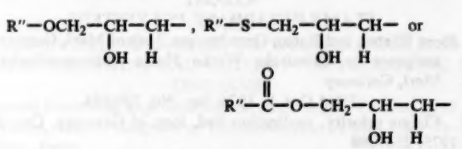
**Int. Cl.[2] C07F 9/02; C08K 5/36, 5/10, 5/06**

**U.S. Cl. 260—45.85 R** **6 Claims**

1. Phosphites of the formula



wherein A, B and C are identical or different radicals, and at least one is a member of the structure



wherein R″ is a phenyl- or naphthyl group or a cycloalkyl group having from 5 to 12 ring carbon atoms or an alkyl chain having from 1 to 60 carbon atoms, and any radicals of A, B and C remaining are aryl groups having from 6 to 12 carbon atoms or cycloalkyl groups having from 5 to 12 carbon atoms or alkyl groups having from 1 to 60 carbon atoms, the total sum of carbon atoms contained in the radicals A, B and C being at least 10.

6. Plastic molding compositions containing a phosphite as claimed in claim 1 as stabilizer.

---

**4,129,554**

## THERMOSETTABLE, POLYMERIZABLE RESIN COMPOSITION COMPRISING A POLYEPOXIDE AND A POLYISOCYANATE STABILIZED BY INCORPORATING AN ORGANIC ELECTRON ACCEPTOR

**Yoshiharu Karasawa; Tohru Koyama, both of Hitachi, and Toshikazu Narahara, Naka, all of Japan, assignors to Hitachi Chemical Co., Ltd. and Hitachi, Ltd., both of, Japan**

**Filed May 16, 1977, Ser. No. 797,429**

**Claims priority, application Japan, May 14, 1976, 51-54340; Nov. 15, 1976, 51-136328**

**Int. Cl.[2] C08L 63/00**

**U.S. Cl. 528—48** **28 Claims**

1. In the stabilizing of thermosettable, polymerizable compositions comprising polyepoxides having more than one epoxy group and polyisocyanates having more than one free-isocyanate group, on the average, which are normally catalyzed by a basic curing catalyst for forming in the cured product oxazolidone rings and isocyanurate rings or uretdione rings, or both, the improvement that comprises inhibiting at temperatures of about 60° C. or lower the polymerization of the reactive components in the compositions in the absence of the basic curing catalyst by incorporating into the compositions an electron acceptor selected from the group consisting of:

(1) Compounds having an active methylene or methine group connected to an electron attractive group from the class consisting of group of —CN, $-NO_2$, —COOR, —COR, and —CHO, where R is a lower alkyl group having one to 8 carbon atoms; and

(2) Compounds of $\pi$-type electron acceptor, wherein the amount of the electron acceptor is of $1 \times 10^{-5}$ to 1% by weight based on the total weight of the polyepoxides and polyisocyanates.

**4,129,555**

## POLY-PHENYLENE OXIDE PROCESS EMPLOYING AMINOPHENOL REACTANTS

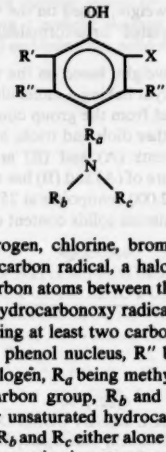
**Dwain M. White, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Mar. 23, 1977, Ser. No. 780,289**

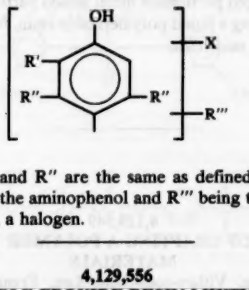
**Int. Cl.[2] C08G 65/44; C08L 25/04**

**U.S. Cl. 260—823** **8 Claims**

1. The process of forming self-condensation products of (a) an aminophenol of the formula



wherein X is hydrogen, chlorine, bromine, or iodine, R′ is hydrogen, a hydrocarbon radical, a halohydrocarbon radical having at least 2 carbon atoms between the halogen atoms and phenol nucleus, a hydrocarbonoxy radical, or a halohydrocarbonoxy radical having at least two carbon atoms between the halogen atoms and phenol nucleus, R″ being the same as R′ and, in addition, halogen, $R_a$ being methylene or a substituted methylene hydrocarbon group, $R_b$ and $R_c$ being acyclic or cyclic, saturated or unsaturated hydrocarbon groups, subject to the proviso that $R_b$ and $R_c$ either alone or in combination do not constitute an aromatic ring structure having an aromatic ring carbon atom directly bonded to the nitrogen atom of the amino group and further subject to the proviso that at least one of $R_b$ or $R_c$ is a hydrocarbon group, and (b) another phenol of the formula



wherein X, R′ and R″ are the same as defined hereinbefore with respect to the aminophenol and R‴ being the same as R′ and in addition, a halogen.

---

**4,129,556**

## CURABLE EPOXIDE RESIN MIXTURES

**Helmut Zondler, Bottmingen, and Roland Moser, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

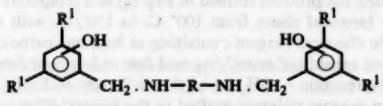
**Filed Dec. 2, 1977, Ser. No. 856,892**

**Claims priority, application Switzerland, Dec. 10, 1976, 15574/76**

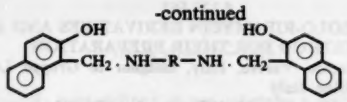
**Int. Cl.[2] C08G 59/50**

**U.S. Cl. 528—97** **9 Claims**

1. A curable mixture comprising (a) a polyepoxide compound having on average more than one epoxide group per molecule and (b) a hydroxyl groups containing diamine of the formula Ia or Ib


(Ia)

-continued



(Ib)

in which R denotes a straight-chain or branched alkylene having a total of 2 to 16 C atoms, an aralkylene having a total of 7 to 12 C atoms, an arylene having a total of 6 to 16 C atoms, a cycloaliphatic or cycloaliphatic-aliphatic radical having 6 to 12 C atoms or a radical which contains at least one N, O or S atom in chains or cyclic groups and $R_1$ denotes hydrogen, halogen or alkyl group having 1 to 4 C atoms, and in which, in formula Ia, the two OH groups are in the ortho-position or para-position relative to the methylene group, there being, in the mixture, 0.5 to 1.5 equivalents of active hydrogen atoms, which are bonded to nitrogen and oxygen in the diamine containing hydroxyl groups, per 1 equivalent of epoxide groups.

---

**4,129,557**

## PROCESS FOR PRODUCING COPOLYMERIZED RESINS

**Ken-ichi Kudo; Yoshihiko Kitawaga; Teruhisa Koyama, all of Niihama; Akira Takata, Habikino; Shuichi Kanagawa, Osaka, and Tetsuo Yamaguchi, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan**

**Filed May 23, 1977, Ser. No. 799,266**

**Claims priority, application Japan, May 26, 1976, 51-61614; May 26, 1976, 51-61615; Jul. 30, 1976, 51-91490; Jul. 30, 1976, 51-91491**

**Int. Cl.[2] C08F** *32/08, 232/08, 216/02*

**U.S. Cl. 526—283** **20 Claims**

1. A thermally copolymerized resin having a softening point of 50° to 200° C., a number average molecular weight of 300 to 1,500 measured by vapor pressure osmometry and a bromine number of less than 120 and soluble in hydrocarbon solvents, the composition of said resin comprising (a) 5 to 95 mol % of one or more monomeric substances selected from cyclopentadiene, dicyclopentadiene and alkyl-substituted compounds thereof, (b) 2 to 25 mol % of one or more codimers of cyclopentadiene and/or an alkyl-substituted compounds thereof and a chain conjugated diolefin having 4 to 5 carbon atoms, and (c) 3 to 70 mol % of one or more hydroxystyrene derivatives.

---

**4,129,558**

## PREPARATION OF FUNCTIONAL POLYMERS

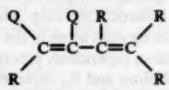
**Charles M. Selman, and Carl A. Uraneck, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.**

**Division of Ser. No. 690,802, May 27, 1976, Pat. No. 4,046,745, which is a division of Ser. No. 625,743, Oct. 24, 1975, Pat. No. 3,993,853. This application Jun. 24, 1977, Ser. No. 809,830**

**Int. Cl.[2] C08F** *4/48, 8/00, 8/08*

**U.S. Cl. 260—823** **23 Claims**

1. Hydroxy functional copolymers of at least one conjugated diene, or of at least one conjugated diene with at least one monovinyl-substituted aromatic hydrocarbon, and a lithium salt of a monohydroxyalkyl-substituted conjugated alkadiene as comonomer, wherein said lithium salt of a monohydroxyalkyl-substituted conjugated alkadiene is the reaction product of effective amounts of a monohydroxyalkyl-substituted conjugated alkadiene with lithium or with a hydrocarbyllithium compound, and wherein said monohydroxyalkyl-substituted conjugated alkadiene is represented by the formula



wherein Q is R or a monohydroxyalkyl group represented by

wherein each R is hydrogen or is an alkyl, cycloalkyl, aryl, or combination radical; each R' is hydrogen, methyl, or ethyl; n is an integer of 1 to 3; such that said monohydroxyalkyl-substituted conjugated alkadiene contains 1 hydroxyalkyl group per molecule.

---

**4,129,559**

## REVERSE OSMOSIS ANISOTROPIC MEMBRANES BASED ON POLYPIPERAZINE AMIDES

**Lino Credali, Casalecchio (Bologna); Giovanni Baruzzi, Ferrara, and Vincenzo Guidotti, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy**

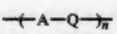
**Continuation of Ser. No. 433,087, Jan. 14, 1974, abandoned. This application Oct. 28, 1975, Ser. No. 626,289**

**Claims priority, application Italy, Jan. 16, 1973, 19247 A/73**

**Int. Cl.[2] C08G** *69/26;* **B01D** *39/16*

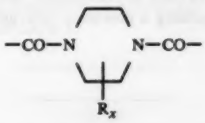
**U.S. Cl. 528—337** **6 Claims**

1. Polypiperazine amide reverse osmosis anisotropic-gel membrane consisting essentially of the repeating unit having the formula (I):



(I)

wherein n is a whole number sufficiently high to impart to the polymer a molecular weight suitable for the formation of a membrane; —A— is a divalent organic radical having the structure (II):



wherein

is a divalent piperazine ring, x is a whole number between 0 and 8 and R is a lower alkyl group; said R groups, when present in the piperazine ring in a number greater than 1, being placed in any steric position with respect to the ring; —Q— is at least two divalent organic radicals selected from the group consisting of the formulae:

(III)

wherein Y is O or S:

(IV)

and

-continued

(V)

with the proviso that at least 5 mol % of the —Q— groups are of formula (III).

---

**4,129,560**

## PROCESS FOR THE PURIFICATION OF HIGH MOLECULAR WEIGHT PEPTIDES USING NON-IONIC DETERGENTS

**Manfred Zoltobrocki, Frankfurt am Main, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

**Filed Jun. 29, 1977, Ser. No. 810,979**

**Claims priority, application Fed. Rep. of Germany, Jul. 1, 1976, 2629568**

**Int. Cl.[2] C07C *103/52;* C07G *7/00, 15/00***

**U.S. Cl. 260—112 R** **1 Claim**

1. A method for purifying a high molecular weight peptide selected from the group consisting of insulins, insulin analogues, insulin derivatives, natural adrenocorticotropic hormone, growth hormone, glucagon, and glycoproteid hormones of the anterior lobe of the pituitary gland, which peptides have a tendency to associate, which method comprises subjecting a buffered solution of said peptide to ion exchange chromatography on an acidic or basic ion exchanger, said buffered solution additionally comprising a non-ionic detergent.

---

**4,129,561**

## ANTI-ULCER METHANO-DIBENZAZOCINES DERIVATIVES

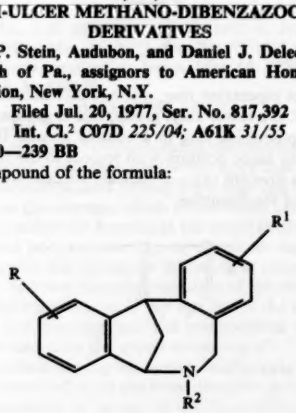
**Reinhardt P. Stein, Audubon, and Daniel J. Delecki, Royersford, both of Pa., assignors to American Home Products Corporation, New York, N.Y.**

**Filed Jul. 20, 1977, Ser. No. 817,392**

**Int. Cl.[2] C07D *225/04;* A61K *31/55***

**U.S. Cl. 260—239 BB** **4 Claims**

1. A compound of the formula:



wherein:

R and $R^1$, independently, are hydrogen, (lower)alkyl, (lower)alkoxy, cyclo(lower)alkyl, halo, or phenyl; and

$R^2$ is di(lower)alkylaminoacetyl or di(lower)alkylaminoethyl; or a non-toxic acid addition salt thereof.

**4,129,562**

## THIAZOLO-RIFAMYCIN DERIVATIVES AND A METHOD FOR THEIR PREPARATION

**Renato Cricchio, Varese, Italy, assignor to Gruppo Lepetit S.p.A., Milan, Italy**

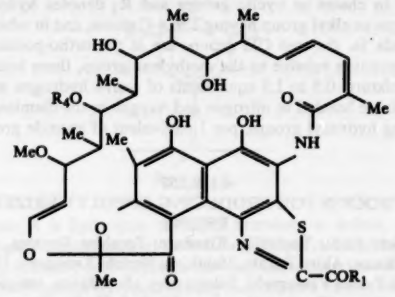
**Filed May 12, 1977, Ser. No. 796,291**

**Claims priority, application United Kingdom, May 28, 1976, 22205/76**

**Int. Cl.[2] C07D *513/18***

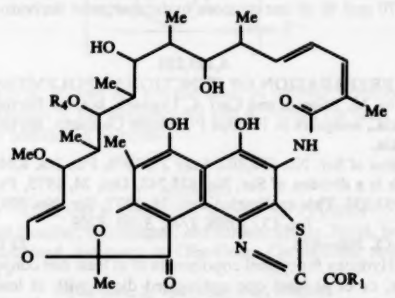
**U.S. Cl. 260—239.3 P** **10 Claims**

1. A compound of the formula:

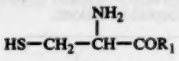


wherein: $R_1$ represents loweralkoxy, cycloalkoxy having from 5 to 8 carbon atoms in the ring, phenoxy, benzoxy, or an amino or hydrazino moiety represented by the formulas: $—NR_2R_3$ and $—NH—NR_2R_3$, respectively, wherein $R_2$ and $R_3$ are independently selected from the group consisting of hydrogen, lower alkyl hydroxy lower alkyl, cycloalkyl having from 5 to 8 carbon atoms in the ring, phenyl or benzyl or $R_2$ and $R_3$ taken together with the adjacent nitrogen atom represent a saturated 5 or 6 membered heterocyclic ring which may contain an additional nitrogen or oxygen atom in the ring thereby forming a residue of pyrrolidino, piperidino, piperazino, N-lower alkylpiperazino or morpholino and $R_4$ represents hydrogen or acetyl.

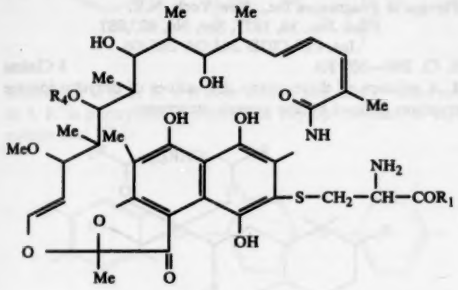
2. A process for preparing a 4-desoxy-thiazolo[5,4-c]rifamycin SV of the formula:



$R_1$ represents loweralkoxy, cycloalkoxy having from 5 to 8 carbon atoms in the ring, phenoxy, benzoxy, or an amino or hydrazino moiety represented by the formulas: $—NR_2R_3$ and $—NH—NR_2R_3$, respectively, wherein $R_2$ and $R_3$ are independently selected from the group consisting of hydrogen, lower alkyl, hydroxy lower alkyl, cycloalkyl having from 5 to 8 carbon atoms in the ring, phenyl or benzyl or $R_2$ and $R_3$ taken together with the adjacent nitrogen atom represent a saturated 5 or 6 membered heterocyclic ring which may contain an additional nitrogen or oxygen atom in the ring thereby forming a residue of pyrrolidino, piperidino, piperazino, N-lower alkylpiperazino or morpholino and $R_4$ represents hydrogen or acetyl; which comprises reacting rifamycin S or 25-deacetyl rifamycin S with a cysteine having the formula:



wherein $R_1$ is as defined above, whereby a 3-(2-substituted ethylthio)-rifamycin SV of the formula:



is obtained, wherein $R_1$ and $R_4$ are as defined before, and contacting said 3-(2-substituted ethylthio)-rifamycin SV with an oxidizing agent in an aqueous buffered water-miscible solvent system at a controlled pH of between 2 and 6.5.

---

**4,129,563**

## PYRAZOLINE COMPOUNDS

**Manfred Patsch, and Albert Hettche, both of Ludwigshafen, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany**

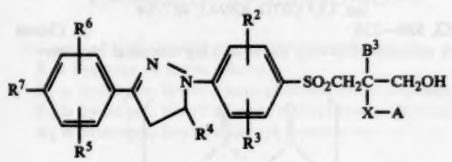
**Filed Jul. 6, 1976, Ser. No. 702,975**

**Claims priority, application Fed. Rep. of Germany, Jul. 31, 1975, 2534180; Aug. 6, 1975, 2535095; Nov. 11, 1975, 2550548**

**Int. Cl.² C07D *231/06, 401/12***

**U.S. Cl. 260—239.9** **5 Claims**

1. A pyrazoline compound of the formula



in which

$B^3$ is hydrogen or $C_1$ to $C_4$ alkyl,

$R^2$, $R^3$, $R^5$, $R^6$ and $R^7$ are independently hydrogen, chlorine, bromine, fluorine, methyl, ethyl, methoxy or ethoxy,

$R^4$ is hydrogen, $C_1$ to $C_4$ is alkyl, benzyl, phenylethyl, phenyl or phenyl substituted by chlorine, bromine, methyl, ethyl, methoxy, ethoxy, cyano or hydroxysulfonyl,

X is —O— or —S— and

A is $C_2$ or $C_3$ alkyl substituted by $C_1$ to $C_4$ dialkylamino, piperidino, pyrrolidino or hexamethyleneimino.

**4,129,564**

## SPIROLACTONES

**Rudolf Wiechert; Dieter Bittler; Ulrich Kerb; Jorge Casals-Stenzel, and Wolfgang Losert, all of Berlin, Fed. Rep. of Germany, assignors to Schering, A.G. Patentabteilung, Berlin, Fed. Rep. of Germany**

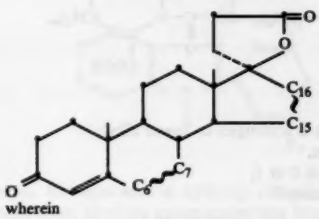
**Filed Nov. 11, 1977, Ser. No. 850,524**

**Claims priority, application Fed. Rep. of Germany, Nov. 16, 1976, 2652761**

**Int. Cl.² A61K *31/58*; C07J *1/00***

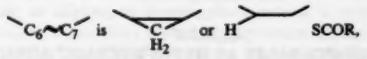
**U.S. Cl. 260—239.57** **19 Claims**

1. A spirolactone of the formula



(I)

wherein



wherein R is lower alkyl of up to 5 carbon atoms, and

19. The method of achieving diuretic effects in mammals which comprises administering a diuretically effective amount of a spirolactone of claim 1.

---

**4,129,565**

## ISOCARBOSTYRIL DERIVATIVES

**Hideo Fukushima, Saitama, and Yoshikuni Suzuki, Kawagoe, both of Japan, assignors to Nisshin Flour Milling Co., Ltd., Tokyo, Japan**

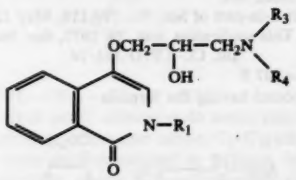
**Continuation-in-part of Ser. No. 703,502, Jul. 8, 1976, abandoned. This application Dec. 16, 1976, Ser. No. 751,522**

**Claims priority, application Japan, Jul. 11, 1976, 51-83408; Fed. Rep. of Germany, Jul. 9, 1976, 2631080; United Kingdom, Jul. 11, 1975, 29335/75**

**Int. Cl.² C07D *217/16, 217/24, 401/12***

**U.S. Cl. 546—142** **6 Claims**

1. A 4-(3-substituted amino-2-hydroxy) propoxy-2-alkyl isocarbostyril compound of the formula



wherein $R_1$ represents $C_1$ to $C_4$ alkyl, and $R_3$ and $R_4$ individually means hydrogen, $C_1$ to $C_6$ alkyl, benzyl or cyclohexyl provided that both $R_3$ and $R_4$ are not hydrogen, or alternatively $R_3$ and $R_4$, together with their adjacent nitrogen atom, is piperidino, piperazino or methylpiperazino, the acid addition salt or quaternary salt thereof.

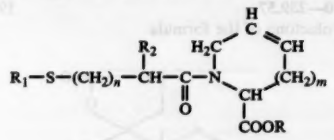
4,129,566

## DERIVATIVES OF DEHYDROCYCLICIMINO ACIDS

Miguel A. Ondetti, Princeton, and Sehsea I. Natarajan, Lawrenceville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 15, 1978, Ser. No. 878,144
Int. Cl.[2] C07D *213/55, 207/16*
U.S. Cl. 546—326 12 Claims

1. A compound of the formula



wherein
R and $R_2$ each is hydrogen or lower alkyl;
$R_1$ is hydrogen,
m and n each is 0 or 1;
and basic salts thereof.

---

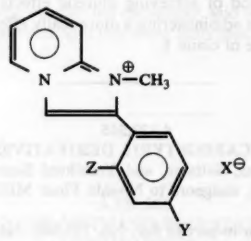
4,129,567

## QUATERNARY SALTS AS HYPOGLYCEMIC AGENTS

Donald E. Kuhla, Gales Ferry, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 712,204, Aug. 6, 1976, Pat. No. 4,044,015, which is a continuation-in-part of Ser. No. 609,914, Sep. 3, 1975, abandoned. This application Aug. 8, 1977, Ser. No. 822,738
Int. Cl.[2] C07D *487/00*
U.S. Cl. 546—121 4 Claims

1. A compound selected from the group consisting of



wherein Y is chlorine, bromine or methoxy; Z is hydrogen or chlorine; and X is a pharmaceutically acceptable anion.

---

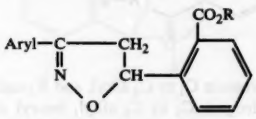
4,129,568

## 2-[3-ARYL-2-ISOXAZOLIN-5-YL]BENZOATES

Robert K. Howe, Bridgeton, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 796,110, May 12, 1977, abandoned. This application Aug. 29, 1977, Ser. No. 828,445
Int. Cl.[2] C07D *263/14*
U.S. Cl. 260—307 F 4 Claims

1. A compound having the formula



wherein Aryl is selected from the group consisting of naphthyl, phenyl, phenyl substituted by one or more halogen, trifluoromethyl, lower alkyl or lower alkoxy moieties and R is selected from the group consisting of hydrogen, lower alkyl and agriculturally acceptable cations.

---

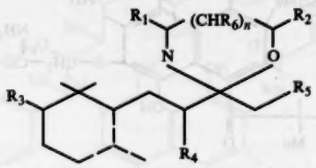
4,129,569

## CYCLIC OXAZO DERIVATIVES

William L. Schreiber, Jackson; James N. Siano, Keyport, and John B. Hall, Rumson, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

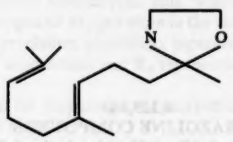
Filed Jun. 16, 1977, Ser. No. 807,057
Int. Cl.[2] C07D *263/04, 265/06*
U.S. Cl. 260—307 FA 3 Claims

1. A mixture of three oxazo derivatives of dihydro ionone derivatives defined by the generic structure:



wherein one of the dashed lines is a carbon carbon double bond and the other two dashed lines are carbon carbon single bonds and n is 0 or 1; $R_1$, $R_2$ and $R_6$ are each the same or different and each represents hydrogen or $C_1$–$C_3$ lower alkyl; and $R_3$, $R_4$ and $R_5$ are each the same or different and each represents hydrogen or methyl, wherein in said mixture, the only difference among the derivatives is in the position of the carbon-to-carbon double bond.

3. A cyclic oxazo derivative of geranyl acetone having the structure:



---

4,129,570

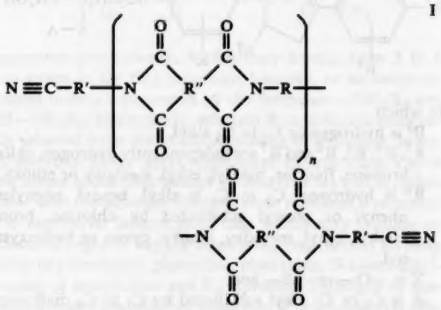
## NITRILE SUBSTITUTED POLYIMIDE OLIGOMERS

Norman Bilow, Los Angeles; Abraham L. Landis, Northridge, and Leroy J. Miller, Canoga Park, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

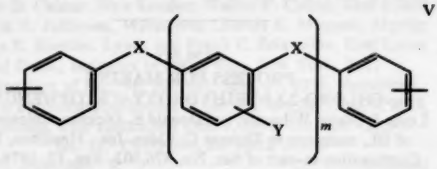
Continuation of Ser. No. 347,535, Apr. 3, 1973, abandoned. This application Jul. 6, 1976, Ser. No. 702,818
Int. Cl.[2] C07D *209/42, 487/04*
U.S. Cl. 528—128 11 Claims

1. A compound having the following chemical structure

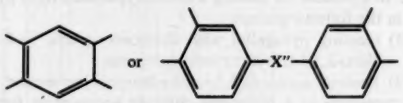
I



wherein R is a divalent moiety of the formula



wherein X is O or S, Y is H or C≡N, and m is a value from 0 to 4, R′ is phenylene, naphthylene, oxydiphenylene, or diphenylene and R″ is



where X″ is CO, O, $CH_2$, S, or a bond and n has an average value of from 1 to 4.

---

**4,129,571**

## AMINO ACID DERIVATIVES

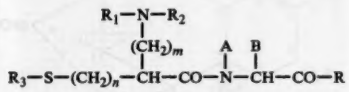
**Miguel A. Ondetti, Princeton, and Michael E. Condon, Lawrenceville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.**

**Division of Ser. No. 759,685, Jan. 17, 1977. This application Oct. 31, 1977, Ser. No. 846,645**

**Int. Cl.[2] C07D *207/16, 403/12***

**U.S. Cl. 260—326.2** **11 Claims**

1. A compound of the formula



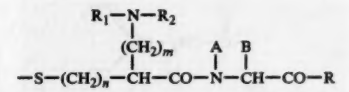
and salts physiologically acceptable thereof, wherein

R is hydroxy or lower alkoxy

$R_1$ is hydrogen, lower alkanoyl or amino (imino)methyl;

$R_2$ is hydrogen, lower alkyl or phenyl-lower alkylene;

$R_3$ is hydrogen, lower alkanoyl, benzoyl or



A and B together form a $(CH_2)_p$ bridge which completes an unsubstituted ring of 5 atoms with the nitrogen and carbon to which they are joined or said ring substituted with a hydroxy group;

m is 1, 2, 3, or 4;

n is 0 or 1; and

p is 3.

**4,129,572**

## PHENYL-2 INDOLE DERIVATIVES

**Charles Pigerol, Saint-Ouen; Paul de Cointet de Fillain, and Yves Bazile, both of Sisteron, all of France, assignors to Labaz, Paris, France**

**Filed Jul. 1, 1977, Ser. No. 812,253**

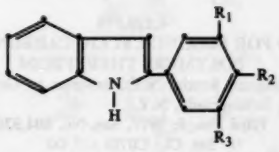
**Claims priority, application France, Jul. 15, 1976, 76 21587**

**The portion of the term of this patent subsequent to May 17, 1994, has been disclaimed.**

**Int. Cl.[2] C07D *209/12***

**U.S. Cl. 260—326.12 R** **5 Claims**

1. A compound of the formula:



wherein $R_1$ represents a hydroxy radical, a branched- or straight-chain alkyloxy group containing from 1 to 12 carbon atoms, an allyloxy or propargyloxy radical, a cyclohexyloxy radical or a benzyloxy radical, $R_2$ represents a hydroxy radical, an ethoxy, methylsulphonyloxy, benzenesulphonyloxy or toluenesulphonyloxy group and $R_3$ represents a hydrogen atom, a hydroxy radical or a methoxy group, with the proviso that when $R_2$ represents a hydroxy or ethoxy group, $R_1$ represents allyloxy or propargyloxy.

---

**4,129,573**

## COMPOSITIONS FOR AND METHOD OF INFLUENCING PLANT GROWTH AND NOVEL 1-PHENYL-2-OXO-PYRROLIDINE-4-CARBOXYLIC ACID DERIVATIVES

**Daniel Bellus, Riehen; Werner Föry, Basel, and Hans Tobler, Allschwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

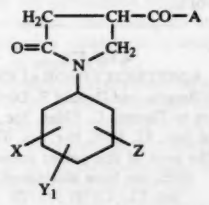
**Filed Oct. 28, 1976, Ser. No. 736,656**

**Claims priority, application Switzerland, Nov. 7, 1975, 14427/75**

**Int. Cl.[2] C07D *207/26;* A01N *9/22***

**U.S. Cl. 260—326.45** **3 Claims**

1. 1-Phenyl-2-oxo-pyrrolidine-4-carboxylic acids of the formula



wherein

A is —OH,—$OR_1$, —$SR_2$ or —CN;

$R_1$ is an alkali metal, alkaline-earth metal, zinc, copper, iron or quaternary ammonium cation; $C_1$-$C_{18}$ alkyl or $C_1$-$C_{18}$ alkyl mono-to-tri-substituted by halogen, hydroxyl, alkoxy, alkylthio, amino, mono-alkyl amino, dialkyl amino, cyano, alkoxycarbonyl, carbamoyl, tetrahydrofuryl or tetrahydropyranyl, the alkyl moieties of these substituents having 1–4 carbon atoms; $C_3$-$C_8$ alkenyl; $C_3$-$C_8$ haloalkenyl; $C_3$-$C_8$ alkynyl; $C_3$-$C_8$ haloalkynyl; $C_3$-$C_{12}$ cycloalkyl; phenyl, benzyl or phenylethyl, or phenyl, benzyl or phenylethyl substituted by alkyl, alkoxy, alkylthio, N-alkylamino, N,N-dialkylamino, halogen, trifluoromethyl,

amino or nitro, the alkyl moieties of these substituents having 1–4 carbon atoms;

$R_2$ is $C_1$–$C_6$ alkyl, benzyl, phenyl, or benzyl and phenyl substituted by alkyl, alkoxy, alkylthio, N-alkylamino, N,N-dialkylamino, halogen, trifluoromethyl, amino or nitro, the alkyl moieties of these substituents having 1–4 carbon atoms;

X is $-NH-SO_2CF_3$ or $-NH-SO_2CH_3$ in the 3- or 4- position;

$Y_1$ is halogen, trifluoromethyl, $C_1$–$C_4$ alkyl or $C_1$–$C_4$ alkylthio; and

Z is hydrogen or $C_1$–$C_4$ alkyl.

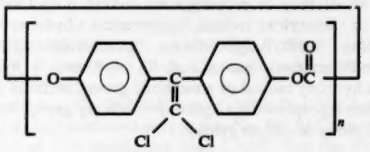
---

## 4,129,574
## METHOD FOR MAKING CYCLIC CARBONATES AND POLYMERS THEREFROM

**John E. Hallgren, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

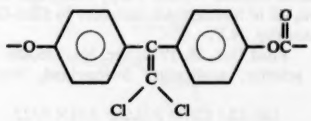
**Filed Jun. 9, 1977, Ser. No. 804,938**
**Int. Cl.² C07D *323/00***
**U.S. Cl. 260—340.2** **6 Claims**

1. A method for making cyclic carbonates of the formula,



where n is 3 or 4, which comprises

(1) agitating at a temperature in the range of from 0° C. to 200° C., an organic solvent solution of a linear polycarbonate consisting essentially of chemically combined units of the formula,



in the presence of an effective amount of a tertiary organic amine catalyst, and

(2) removing the precipitated cyclic carbonate trimer from the mixture of (1).

---

## 4,129,575
## 8-METHOXYPSORALEN

**Louis J. Glunz, Wilmette, and Donald E. Dickson, Chicago, both of Ill., assignors to Thomas C. Elder, Inc., Hamilton, Ind.**

**Filed Apr. 12, 1976, Ser. No. 676,302**
**The portion of the term of this patent subsequent to Dec. 12, 1995, has been disclaimed.**
**Int. Cl.² C07D *311/78***
**U.S. Cl. 260—343.21** **15 Claims**

1. In a process for making 8-methoxypsoralen from pyrogallol in the following steps:

(1) reacting pyrogallol with chloracetic acid to form ω-chloro-2,3,4-trihydroxyacetophenone,

(2) heating ω-chloro-2,3,4-trihydroxyacetophenone in the presence of a hydrogen chloride acceptor to form 6,7-dihydroxycoumaranone,

(3) hydrogenating 6,7-dihydroxycoumaranone to form 6,7-dihydroxy-2,3,-dihydrobenzofuran,

(4) reacting 6,7-dihydroxy-2,3-dihydrobenzofuran with malic acid to form 2,3-dihydroxanthotoxol,

(5–6) methylating and dehydrogenating to form 8-methoxypsoralen,

the improvement which comprises effecting step 3 with elemental hydrogen over a palladium catalyst in a solution of acetic acid in ethyl acetate.

---

## 4,129,576
## PROCESS FOR MAKING ω-CHLORO-2,3,4-TRIHYDROXYACETOPHENONE

**Louis J. Glunz, Wilmette, and Donald E. Dickson, Chicago, both of Ill., assignors to Thomas C. Elder, Inc., Hamilton, Ind.**

**Continuation-in-part of Ser. No. 676,302, Apr. 12, 1976. This application Jun. 24, 1976, Ser. No. 699,466**
**The portion of the term of this patent subsequent to Dec. 12, 1995, has been disclaimed.**
**Int. Cl.² C07D *311/78; C07C 49/78***
**U.S. Cl. 260—343.21** **10 Claims**

1. In a process for making 8-methoxypsoralen from pyrogallol in the following steps:

(1) reacting pyrogallol with chloroacetic acid to form ω-chloro-2,3,4-trihydroxyacetophenone,

(2) heating ω-chloro-2,3,4-trihydroxyacetophenone in the presence of a hydrogen chloride acceptor to form 6,7-dihydroxycoumaranone,

(3) hydrogenating 6,7-dihydroxycoumaranone to form 6,7-dihydroxy-2,3,-dihydrobenzofuran,

(4) reacting 6,7-dihydroxy-2,3-dihydrobenzofuran with malic acid to form 2,3-dihydroxanthotoxol,

(5–6) methylating and dehydrogenating to form 8-methoxypsoralen,

the improvement which comprises, effecting step 1 with boron trifluoride as the condensing agent and a two-fold excess of chloroacetic acid, in which the hydrogenation of 6,7-dihydroxycoumaranone is effected with elemental hydrogen over a palladium catalyst in a solution of acetic acid in ethyl acetate.

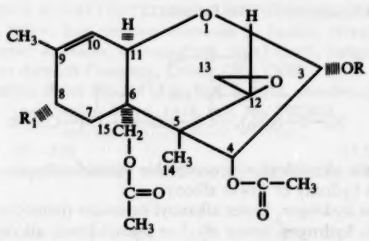
---

## 4,129,577
## DERIVATIVE OF T-2 TOXIN AND ANGUIDINE

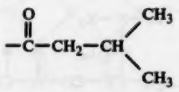
**Robert A. Ellison, Madison, Wis., and Frank N. Kotsonis, Kansas City, Mo., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.**

**Continuation of Ser. No. 646,647, Jan. 5, 1976, abandoned. This application Aug. 19, 1977, Ser. No. 826,067**
**Int. Cl.² C07C *311/02; A61K 31/35***
**U.S. Cl. 260—345.2** **3 Claims**

1. A compound having the general formula



in which $R_1$ is



and R is an alkanoate having the general formula

in which R″ is an alkyl group having from 1 to 11 carbon atoms.

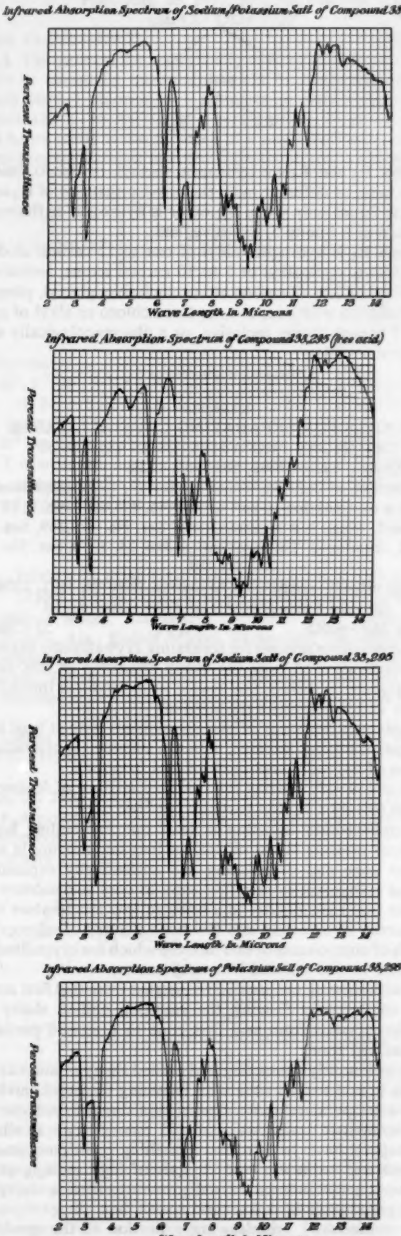
## 4,129,578
## POLYCYCLIC ETHER ANTIBIOTIC

Walter D. Celmer, New London; Walter P. Cullen, East Lyme; Mark T. Jefferson, Waterford; Charles E. Moppett, Mystic; John B. Routien, Lyme, and Frank C. Sciavolino, East Lyme, all of Conn., assignors to Pfizer Inc., New York, N.Y.

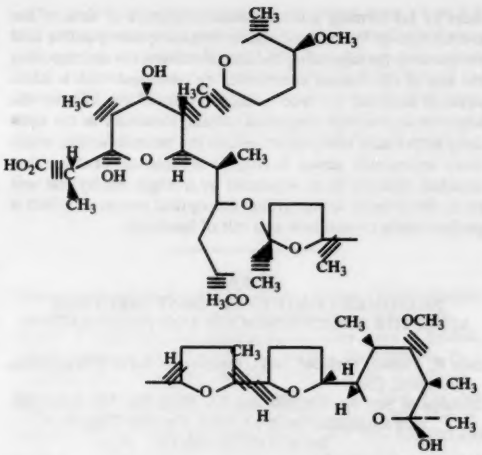
Continuation of Ser. No. 558,785, Mar. 17, 1975, abandoned, which is a continuation-in-part of Ser. No. 496,289, Aug. 9, 1974, abandoned. This application Oct. 1, 1976, Ser. No. 728,907

Int. Cl.[2] C07D *309/22;* A61K *31/35*

U.S. Cl. 260—345.7 R 4 Claims


Infrared Absorption Spectrum of Sodium/Potassium Salt of Compound 38,295
Percent Transmittance
Wave Length, In Microns
Infrared Absorption Spectrum of Compound 38,295 (free acid)
Percent Transmittance
Wave Length, In Microns
Infrared Absorption Spectrum of Sodium Salt of Compound 38,295
Percent Transmittance
Wave Length, In Microns
Infrared Absorption Spectrum of Potassium Salt of Compound 38,295
Percent Transmittance
Wave Length, In Microns

1. Compound 38,295, an antibiotic having the formula



and the cationic salts thereof.

---

## 4,129,579
## PREPARATION OF 2,3-DIHYDROFURAN

Jung W. Kang, Clinton, and William L. Hergenrother, Akron, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 725,603, Sep. 22, 1976, abandoned, which is a division of Ser. No. 629,168, Nov. 5, 1975, abandoned. This application Aug. 31, 1977, Ser. No. 829,364

Int. Cl.[2] C07D *307/28*

U.S. Cl. 260—346.11 10 Claims

1. A process for the preparation of 2,3-dihydrofuran from 2-hydroxytetrahydrofuran, comprising the steps of:

heating a dehydration catalyst to a temperature of from about 130° C. to about 500° C.;

contacting the 2-hydroxytetrahydrofuran with said dehydration catalyst to form the 2,3-dihydrofuran, said catalyst selected from the class consisting of the 1A and 2A metals of pyrosulfate, phosphorous pentaoxide, and dimethyl sulfoxide; or from the class consisting of $Al_2O_3$, $Mo_2O_3$, $W_2O_3$, and combinations thereof; and

utilizing a sufficient amount of said catalyst to convert a portion of 2-hydroxytetrahydrofuran to said 2,3-dihydrofuran.

---

## 4,129,580
## RESOLUTION OF CERTAIN ASYMMETRIC PRIMARY AMINES USING LASALOCID

John Westley, Cedar Grove, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 708,655, Jul. 26, 1976, abandoned. This application Nov. 14, 1977, Ser. No. 851,317

Int. Cl.[2] C07D *307/22;* C07C *85/26*

U.S. Cl. 260—347.7 7 Claims

1. In a process for resolving a racemic amine into its enantio-

mers by (a) forming a diastereomeric mixture of salts of the enantiomers of the racemic amine with an optically active acid component; (b) separating the diastereomers; (c) decomposing the salt of the desired enantiomer by treatment with a dilute aqueous acid and (d) recovering the desired enantiomer, the improvement which comprises utilizing lasalocid as the optically active acid component and, as the racemic amine, a primary asymmetric amine having its asymmetric center either attached directly to or separated by a single methylene unit from, the primary amino group, one optical isomer of which is preferentially crystallized as a salt of lasalocid.

---

**4,129,581**

## MONOMERS HAVING PENDANT ELECTRON ACCEPTOR GROUPS-PROCESS FOR PREPARATION AND USE

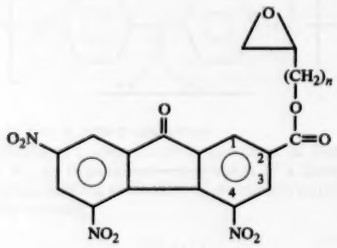
**Sam R. Turner, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

**Division of Ser. No. 596,690, Jul. 16, 1975, Pat. No. 4,062,886. This application May 23, 1977, Ser. No. 799,844**

**Int. Cl.[2] C07D 303/16**

**U.S. Cl. 260—348.45** **1 Claim**

1. Monomers which are represented by the structural formula



wherein n may be from 1 to 10.

---

**4,129,582**

## CIS-4,5-DIDEHYDRO-CIS-13-PGE$_1$, COMPOUNDS

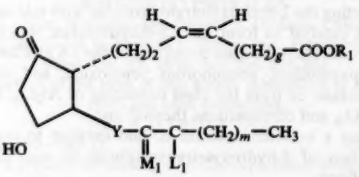
**Ernest W. Yankee, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.**

**Division of Ser. No. 595,869, Jul. 14, 1975, Pat. No. 4,026,909. This application Mar. 3, 1977, Ser. No. 774,078**

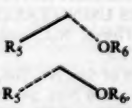
**Int. Cl.[2] C07C 177/00**

**U.S. Cl. 260—408** **25 Claims**

1. A compound of the formula

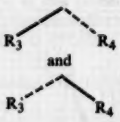


wherein g is two, three, or 4;
wherein Y is cis—CH=CH—;
wherein $M_1$ is



wherein $R_5$ and $R_6$ are hydrogen or methyl, with the proviso that one of $R_5$ and $R_6$ is methyl only when the other is hydrogen;
wherein $L_1$ is

or a mixture of



wherein $R_3$ and $R_4$ are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of $R_3$ and $R_4$ is fluoro only when the other is hydrogen or fluoro;
wherein m is one to 5, inclusive; and
wherein $R_1$ is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

---

**4,129,583**

## PROCESS FOR SEPARATING CRYSTALLIZABLE FRACTIONS FROM MIXTURES THEREOF

**Klaus Zondek, Callao 3385, Santiago, Chile**

**Continuation of Ser. No. 686,807, May 17, 1976, abandoned, which is a continuation-in-part of Ser. No. 476,685, Jun. 5, 1974, abandoned, which is a continuation of Ser. No. 170,249, Sep. 8, 1971, abandoned. This application Jan. 24, 1978, Ser. No. 871,964**

**Claims priority, application Argentina, May 19, 1971, 235663**

**Int. Cl.[2] C09F 5/10; C11B 3/00; C10G 43/06**

**U.S. Cl. 260—428.5** **12 Claims**

1. A continuous process for separating crystallizable organic components selected from the group consisting of fats, fatty acids, glycerides thereof and waxes from mixtures thereof in solution which comprises the steps of:

(A) mixing a feedstock of said components with at least one organic solvent therefor, which is suitable for crystallization of desired components of said feedstock,

(B) continuously feeding the resulting mixture of feedstock and solvent to a first partially confined zone,

(C) continuously injecting at least one low-boiling high-vapor pressure liquid refrigerant into said mixture in said first zone and evaporating and adiabatically expanding said refrigerant in said first zone to cool said mixture in said first zone rapidly to a selected low temperature and thereby form within said first zone a slurry of microcrystals of components of said mixture which are crystallizable down to said selected low temperature,

(D) withdrawing evaporated refrigerant from said first zone,

(E) continuously flowing the resulting chilled slurry of microcrystals from said first zone to a second partially confined zone,

(F) continuously contacting said chilled slurry of microcrystals in said second zone with incoming feedstock mixture at a temperature above that of said slurry to achieve an intermediate temperature in said second zone at which temperature crystals of lower melting point components melt and redissolve and crystals of high melting point components undergo crystal growth to form a slurry of larger crystals in said second zone,

(G) continuously withdrawing a portion of the resulting slurry of larger crystals from said second zone, and

(H) separating crystals from said withdrawn slurry.

5. A process according to claim 1, in which said feedstock comprises a mixture of fatty acids and/or glycerides thereof and solvent.

---

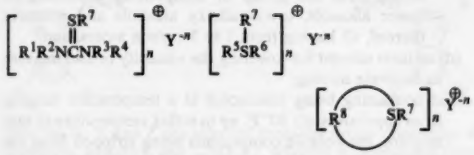
**4,129,584**

## PROCESS FOR PREPARING DIMETHYLTIN DICHLORIDE

**Gerald H. Reifenberg, Hightstown, N.J., assignor to Pennwalt Corporation, Philadelphia, Pa.**

**Filed Aug. 29, 1977, Ser. No. 828,578**
**Int. Cl.² C07F 7/22**
**U.S. Cl. 260—429.7** **12 Claims**

1. The process for catalytically making dimethyltin dichloride in essentially quantitative yield by contacting tin metal with methyl chloride at a temperature within the range of about 120° C. to 300° C. for a period within the range of 0.5 to 24 hours while in the presence of a single sulfonium or isothiuronium salt catalyst selected from the group consisting of:



wherein:

$R^1$, $R^2$, $R^3$, $R^4$, $R^5$. $R^6$, and $R^7$ are hydrocarbyl radicals of 1 to 24 carbon atoms, $R^1$, $R^2$, $R^3$, and $R^4$ can also be hydrogen;

$R^8$ is a hydrocarbon linking group of 3–5 carbon atoms;

Y is an anion, n is the valence of anion Y; and while in the presence of a liquid solvent for methyl chloride at the beginning of the reaction.

---

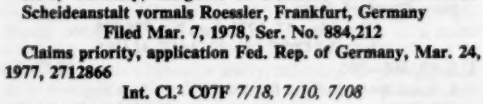
**4,129,585**

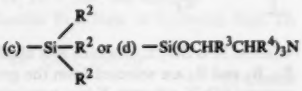
## PROCESS FOR THE PRODUCTION OF SULFUR CONTAINING ORGANOSILICON COMPOUNDS

**Wolfgang Buder, Rodenbach, Germany; Hans-Dieter Pletka, Mobile, Ala.; Rudolf Michel, Freigericht, Germany; Rudolf Schwarz, Wasserlos, Germany, and Gerhard Düsing, Eppstein, Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany**

**Filed Mar. 7, 1978, Ser. No. 884,212**
**Claims priority, application Fed. Rep. of Germany, Mar. 24, 1977, 2712866**
**Int. Cl.² C07F 7/18, 7/10, 7/08**
**U.S. Cl. 260—448.8 R** **12 Claims**

1. A process for the production of sulfur containing organosilicon compounds of the formula (I) Z — Alk — $S_x$ — Alk — Z, where Z is the grouping:





in which $R^1$ is an alkyl group having 1 to 5 carbon atoms, a cycloalkyl group with 5 to 8 carbon atoms, the benzyl group, phenyl or phenyl substituted with at least one methyl, ethyl or chloro group, $R^2$ is alkoxy of 1 to 4 carbon atoms, methoxyethoxy, cycloalkoxy with 5 to 8 carbon atoms, phenoxy or benzyloxy, $R^3$ and $R^4$ are alkyl of 1 to 3 carbon atoms or hydrogen, Alk is a divalent saturated hydrocarbon group having 1 to 5 carbon atoms or such a group interrupted by —O—, —S— or —NH— and x is a number from 2.0 to 6.0, said process comprising reacting an alkali metal alcoholate with a compound of the formula (II) Z — Alk — Hal, where Hal is chlorine, bromine or iodine with a hydrosulfide of the formula (III) MeSH, in which Me is ammonium, an alkali metal atom or an equivalent of an alkaline earth metal or zinc and with sulfur and removing the halide formed from the product.

---

**4,129,586**

## PEROXIDE FREE RADICAL INITIATORS CONTAINING ULTRAVIOLET LIGHT STABILIZING GROUPS

**Chester S. Sheppard, and Ronald E. MacLeay, both of Buffalo, N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.**

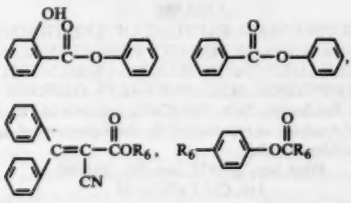
**Continuation of Ser. No. 663,653, Mar. 4, 1976, abandoned, which is a division of Ser. No. 435,623, Jan. 22, 1974, Pat. No. 3,956,269, which is a continuation of Ser. No. 98,893, Dec. 6, 1970, abandoned. This application Jun. 6, 1977, Ser. No. 803,493**
**Int. Cl.² C07C 179/06, 179/10, 179/18**
**U.S. Cl. 260—465 D** **7 Claims**

1. A free radical initiator containing ultraviolet light stabilizing radicals and having the formula R—O—O—R′ wherein

(a) R and R′ are independently selected from the group consisting of hydrogen, carboxylic acyl of 2–20 carbons, aroyl of 7–20 carbons, tert-alkyl of 4–12 carbons, tert-aralkyl of 9–15 carbons, alkoxycarbonyl of 2–20 carbons, cycloalkoxycarbonyl of 4–20 carbons, carbamoyl, phenylcarbamoyl, alkylcarbamoyl of 2–13 carbons, and cycloalkylcarbamoyl of 4–13 carbons,

(b) only one of R and R′ can be hydrogen; and

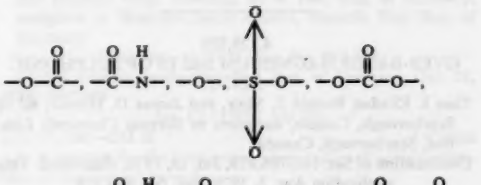
(c) at least one of non-hydrogen R and R″ moieties contains an ultraviolet light stabilizing radical selected from the group consisting of



and



where $R_6$ is alkyl of 1–6 carbons and the ultraviolet light stabilizing radical is joined to the R and R′ moieties at a ring carbon of the ultraviolet light stabilizing radical or at a carbon in the $R_6$ group of the ultraviolet light stabilizing radical either directly or through a coupling group selected from the class consisting of

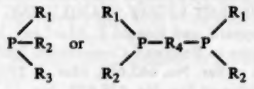


## 4,129,587
## DIMERIZATION PROCESS

James R. Jennings, and Dipankar Sen, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Nov. 23, 1977, Ser. No. 854,491
Claims priority, application United Kingdom, Nov. 24, 1976, 48959/76
Int. Cl.[2] C07C *120/00, 121/20*
U.S. Cl. 260—465.8 D 8 Claims

1. A process for the dimerisation of acrylonitrile to predominantly 1,4-dicyanobutenes, in which the acrylonitrile is contacted with an organic phosphorus (III) compound having the formula



where $R_1$ is a hydrocarbyl group, $R_2$ is an alkoxy or cycloalkoxy group, $R_3$ is a hydrocarbyl, alkoxy or cycloalkoxy group and $R_4$ is a divalent hydrocarbyl or hydrocarbyloxy group, each hydrocarbyl or hydrocarbyloxy group having from 1 to 10 carbon atoms and being unsubstituted or substituted by halogen, cyanide or alkyl groups, at a temperature from 0° to 120° C., the acrylonitrile being dissolved in an organic solvent capable of donating protons, optionally with an inert non-hydroxylic co-solvent, the concentrations of acrylonitrole and said phosphorus (III) compound being in the ranges 5 to 75% and 0.01 to 5% by volume, respectively, and the acrylonitrile and solvent or solvents being substantially dry, characterised in that a polymeric by-product reducing amount of an anhydrous metal compound capable of reducing the proportion of polymeric by-products is added to the reaction mixture, the metal being selected from Group IVA to VIIA, VIII and IB to VB of the Periodic Table of Elements.

---

## 4,129,588
## SELECTIVE MANUFACTURE OF ANHYDROUS MODIFICATIONS OF METHYL PHOSPHONIC ACID AND USE THEREOF IN MAKING PURE METHYL PHOSPHONIC ACID AND SALTS THEREOF

William A. Sanderson, Palo Alto, Calif., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Sep. 7, 1973, Ser. No. 394,982
Int. Cl.[2] C07F *9/38*
U.S. Cl. 260—502.4 P 7 Claims

1. Process for the selective manufacture of pyro-methyl phosphonic acid from dimethyl phosphite which comprises introducing dimethyl phosphite into a reaction zone, heating the dimethyl phosphite according to a temperature regime which lies predominantly above 170° C., the heating at least in later stages being conducted at temperatures above 200° C. while maintaining the phosphite in liquid phase, whereby vapors of dimethyl ether are evolved, removing the dimethyl ether containing vapors from the reaction zone, and continuing said heating until gas evolution substantially ceases and a liquid product containing more than about 97% pyro-methyl phosphonic acid is obtained.

---

## 4,129,589
## OVER-BASED MAGNESIUM SALTS OF SULPHONIC ACIDS

Theo I. Eliades; Ronald J. Muir, and James D. Horner, all of Scarborough, Canada, assignors to Surpass Chemicals Limited, Scarborough, Canada

Continuation of Ser. No. 705,678, Jul. 15, 1976, abandoned. This application Apr. 3, 1978, Ser. No. 892,978
Int. Cl.[2] C07B *13/00;* C07C *143/24;* C09K *3/00*
U.S. Cl. 260—504 A 29 Claims

1. A process for preparing an over-based oil-soluble magnesium salt of a sulfonic acid having a metal ratio of approximately 10 to approximately 40; comprising contacting carbon dioxide gas with a mixture comprising:

(a) an oil-soluble magnesium salt of a sulfonic acid,

(b) more than ten equivalents up to approximately 40 equivalents of a light magnesium oxide per equivalent of sulfonic acid,

(c) a promoter system comprising:

(1) from approximately 0.5 to approximately 5 equivalents of an essentially oil-insoluble carboxylic compound per equivalent of sulfonic acid, said compound being selected from the group of compounds consisting of lower carboxylic acids, substituted lower carboxylic acids, and mixtures thereof, all having from 1 to 5 carbon atoms,

(2) from approximately 2 to approximately 30 equivalents of water per equivalent of sulfonic acid, and

(3) from 0 to approximately 35 equivalents of an alcohol per equivalent of sulfonic acid, said alcohol being selected from the group of components consisting of lower alkanols, lower alkoxy alkanols and mixtures thereof, all having from 1 to 5 carbon atoms, and

(d) an inert solvent for lowering the viscosity of said mixture to facilitate mixing;

said contacting being conducted at a temperature ranging from approximately 50° F. up to reflux temperature of said mixture, the volatile components being stripped from the reaction mixture after absorption of the carbon dioxide gas by the reaction mixture is at a desired level to give an over-based, oil-soluble magnesium salt of a sulfonic acid.

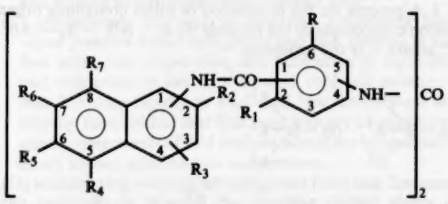
---

## 4,129,590
## UREYLENEBIS(ANIONIC SUBSTITUTED PHENYLENE CARBONYL)IMINO NAPHTHALENE SULFONIC ACIDS AND NAPHTHALENE CARBOXYLIC ACIDS AND THEIR SALTS

Ransom B. Conrow, Pearl River, and Seymour Bernstein, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 17, 1977, Ser. No. 778,398
Int. Cl.[2] C07C *143/30;* A61K *31/185*
U.S. Cl. 260—506 15 Claims

1. A compound of the formula:



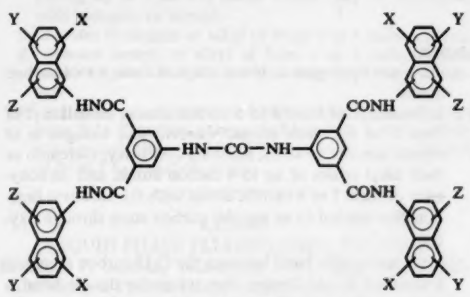
wherein R is $SO_3X$, wherein X is alkali metal; $R_1$ is hydrogen; $R_4$, $R_5$ and $R_6$ are selected from the group consisting of hydrogen and $SO_3X$, wherein X is as previously defined; $R_2$ is hydrogen; with the proviso that there is no $R_1$ or $R_2$ substituent when the bridgehead carbonylimino is attached at the carbon 2-position of the respective ring; with the further proviso that each naphthalene moiety must contain two or three $SO_3X$ substituents, wherein X is as previously defined; $R_3$ is $SO_3X$, wherein X is as previously defined; $R_7$ is selected from the group consisting of hydrogen, hydroxy and $SO_3X$, wherein X is as previously defined; and other pharmaceutically acceptable salts.

## 4,129,591
## UREIDA-PHENYLENEBIS(SUBSTITUTED IMINO)MULTIANIONIC SUBSTITUTED DINAPHTHALENE SULFONIC ACIDS AND SALTS

Seymour Bernstein, New City, N.Y.; Robert H. Lenhard, Paramus, N.J., and Ransom B. Conrow, Pearl River, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Oct. 27, 1976, Ser. No. 736,042
Int. Cl.² C07C *143/53;* A61K *31/185*
U.S. Cl. 260—506 8 Claims

1. A compound of the formula:




wherein X, Y and Z are selected from the group consisting of hydrogen, hydroxy, and $-SO_3R_1$, wherein $R_1$ is selected from the group ccnsisting of hydrogen, alkali metal and alkali earth methal; and with the proviso that when X, Y or Z is hydrogen or hydroxy, then the remaining two substituents must be $-SO_3R_1$.

## 4,129,592
## HYDROCARBON OXIDATION PROCESS

William E. Slinkard, and Anthony B. Baylis, both of Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.

Filed Apr. 7, 1976, Ser. No. 674,357
Int. Cl.² C07C *51/20*
U.S. Cl. 562—549 8 Claims

1. A process for producing acetic acid which comprises contacting butane and an oxygen containing gas in the vapor phase with a reduced molybdenum catalyst, wherein said molybdenum catalyst is prepared by coprecipitating a molybdenum compound and one or more compounds of a metal selected from the group consisting of Ti, Zr, Sn, Hf, Nb and Ta from an aqueous solution or slurry; calcining the precipitate in air or nitrogen at about 300°–650° C. for about 4–20 hours; and reducing the calcined composition by contacting with a reducing gas at about 300°–600° C. for about 4–48 hours.

## 4,129,593
## PROCESS FOR THE PRODUCTION OF HIGH PURITY S-CARBOXYMETHYL-L-CYSTEINE

Alfred Maierhofer, Allensbach, and Hans Wagner, Kostanz, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Filed Sep. 14, 1977, Ser. No. 833,043
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1976, 2647094
Int. Cl.² C07C *101/20*
U.S. Cl. 562—557 12 Claims

1. In a process for the production of highly pure S-carboxymethyl-L-cysteine by reacting L-cystine in luqiid ammonia with metallic sodium to form the disodium salt of L-cysteine, vaporizing the ammonia, reacting the disodium salt of L-cysteine with an aqueous solution of chloroacetic acid and precipitating the S-carboxymethyl-L-cysteine formed by acidifying the reaction mixture, the improvement comprising carrying out the reaction of the disodium salt of L-cysteine with aqueous chloroacetic acid in the presence of 0.1 to 10 weight percent based on the chloroacetic acid of a reducing agent which is formic acid or an alkali salt of an oxygen containing acid of sulfur wherein the sulfur has a valance below 6, all steps of the process being carried out with the exclusion of air.

## 4,129,594
## PROCESS FOR THE MANUFACTURE OF AROMATIC DICARBOXYLIC ACID CHLORIDES

Josefina T. Baker, Mount Tabor, N.J.; John Pisanchyn, Olyphant, Pa., and Stylianos Sifniades, Madison, N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Oct. 27, 1977, Ser. No. 846,098
Int. Cl.² C07C *63/30, 63/22, 63/38, 63/46*
U.S. Cl. 260—544 D 14 Claims

1. In a process for preparing aromatic dicarboxylic acid chlorides, in solution or slurry form for direct use as acylating agents, which comprises adding an aromatic dicarboxylic acid to a liquid medium containing phosgene and a weak tertiary amine base at a temperature of about 10° to 50° C., the improvement which comprises providing in the reaction mixture, at least 1.02 equivalents of the weak tertiary amine base having a $pK_b$ of 9.0 ± 2.0 as measured in aqueous solution at 25° C. per equivalent of carboxylic acid group present in the reaction mixture as such, throughout the reaction period, and providing in the reaction mixture about 8 to 30 parts by weight of a chlorinated paraffinic hydrocarbon solvent containing 1–6 carbon atoms and 1–4 chlorine atoms per part of total dicarboxylic acid employed, whereby a yield of dicarboxylic acid chloride of at least about 90% of theory, based on the total dicarboxylic acid employed in the reaction, is obtained.

## 4,129,595
## PREPARATION OF CHLOROACETYL CHLORIDE

Shigeto Suzuki, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 29, 1978, Ser. No. 891,429
Int. Cl.² C07C *51/58*
U.S. Cl. 260—544 Y 3 Claims

1. A process for preparing chloroacetyl chloride which comprises reacting glycolic acid with 2 moles of thionyl chloride in the presence of a catalytic amont of a nitrogen-containing hydrocarbyl organic compound having a total of not more than about 10 carbon atoms selcted from the group consisting of amides, imides, amines, quaternary ammonium salts and ureas or a hydrocarbyl phosphine compound having a total of not more than about 30 carbon atoms selected from the group consisting of trihydrocarbylphosphines and trihydrocarbylphosphine oxides, wherein not more than 0.15 moles of the catalyst is used per mole of glycolic acid, maintaining the reaction at a temperature and for a time sufficient to convert the glycolic acid to chloroacetyl chloride, and separating chloroacetyl chloride.

## 4,129,596
## PROCESS FOR THE CONTINUOUS PREPARATION OF ACETOACETAMIDES

Gerhard Kunstle, Raitenhaslach; Hellmuth Spes, Burghausen, and Herbert Siegl, Haiming, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Oct. 11, 1977, Ser. No. 840,709
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1976, 2647499
Int. Cl.² C07C *102/00*
U.S. Cl. 260—561 K 3 Claims

1. A process for the continuous preparation of acetoacetamides of the general formula

$$CH_3COCH_2CO—N—R—R',$$

in which R represents alkyl radicals having from 1 to 18 carbon atoms, and R′ represents a member of the group consisting of hydrogen atoms and radicals R, by reaction of diketene in stoichiometric ratio with amines of the general formula

H—N—R—R′,

in which R and R′ have the meaning given above, which consists of carrying out the reaction for a residence time of at the most 15 minutes and at temperatures of at least 60° C. under atmospheric pressure.

---

**4,129,597**

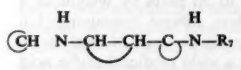
## AMINO COMPOUNDS AND USE THEREOF AS ANTIOXIDANTS

**Neil E. S. Thompson, Creve Coeur, Mo., assignor to Petrolite Corporation, St. Louis, Mo.**

**Filed Jul. 15, 1977, Ser. No. 815,886**
**Int. Cl.² C07C *87/40***
**U.S. Cl. 260—563 P** **7 Claims**

I claim

1. A compound of the formula



where $R_7$ is hydrogen or substituted groups and ◡ indicates a cycloalkyl or substituted cycloalkyl ring.

---

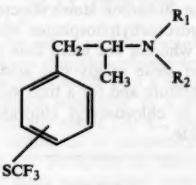
**4,129,598**

## PHENYLETHYLAMINE DERIVATIVES

**Don P. R. L. Giudicelli, Fontenay-sous-Bois, and Henry Najer, Paris, both of France, assignors to Synthelabo, Paris, France**

**Continuation-in-part of Ser. No. 365,181, May 30, 1973, Pat. No. 3,965,190. This application May 24, 1974, Ser. No. 473,231**
**Claims priority, application France, May 31, 1972, 72 19515**
**Int. Cl.² C07C *87/28***
**U.S. Cl. 260—570.8 R** **8 Claims**

1. A phenylethylamine of the formula:



wherein $R_1$ and $R_2$ are independently hydrogen or straight or branched-chain alkyl of 1 to 5 carbon atoms, in the racemic or optically active forms and the acid addition salts thereof.

---

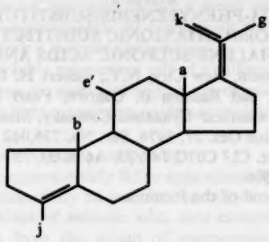
**4,129,599**

## A-NORSTEROIDS

**Sina Escher, Onex, Switzerland, and Grant E. Dubois, Menlo Park, Calif., assignors to The Board of Trustees of Leland Stanford Jr. University, Stanford, Calif.**

**Division of Ser. No. 572,380, Apr. 28, 1975, abandoned. This application Jun. 23, 1977, Ser. No. 809,237**
**Int. Cl.² C07C *49/61***
**U.S. Cl. 260—586 E** **3 Claims**

1. A steroidal compound of the formula:



wherein:

a and b are hydrogen or lower alkyl of from 1 to 4 carbon atoms;

e′ is β-alkenyl of from 3 to 6 carbon atoms, haloalkenyl of from 3 to 6 carbon atoms, wherein said halogen is of atomic number 17 to 35, halovinyl, hydroxy, mercapto or their alkyl ethers of up to 4 carbon atoms, and carboxy-ester of from 1 to 6 carbon atoms with the carboxyl functionality bonded to an annular carbon atom through oxygen;

there is one double bond between the C-17 carbon atom and k signified by the broken line; when the double bond is between the two carbon atoms, k is a perhalocarboxylic acid ester of from 2 to 4 carbon atoms, said halogen being of atomic number 9 to 17 and when the double bond is between the carbon atom and k, k is oxygen;

j is alkyl of from 1 to 4 carbon atoms; and

g is hydrogen, alkyl of from 1 to 4 carbon atoms, hydroxyalkyl of from 1 to 2 carbon atoms, or alkanoyloxyalkyl of up to 8 carbon atoms.

---

**4,129,600**

## METHOD FOR MAKING ACROLEIN AND CATALYST THEREFOR

**David L. Childress, Angleton; William V. Hayes, and Richard L. Poppe, both of Clute, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.**

**Division of Ser. No. 640,616, Dec. 15, 1975, Pat. No. 4,049,577. This application Mar. 18, 1977, Ser. No. 778,907**
**Int. Cl.² C07C *47/20, 47/22***
**U.S. Cl. 260—604 R** **4 Claims**

1. The process of oxidizing in the vapor phase an olefin having from 3 to 6 carbon atoms to the analogous unsaturated aldehyde which comprises introducing a gaseous mixture of the olefin and oxygen together with an inert diluent consisting essentially of nitrogen and carbon oxides at a temperature of from about 285° to about 375° C. and a contact time of from about 0.5 to about 5.0 seconds over a catalyst consisting essentially of the oxides of cobalt, iron, bismuth, molybdenum, potassium and optionally silicon wherein the metals are present in the atomic ratios of

$Co_{4.5\text{-}7.0}Fe_{1\text{-}2}Bi_{1\text{-}2}Mo_{15}K_{0.05\text{-}0.2}$ and when present $Si_{1\text{-}1.5}$.

---

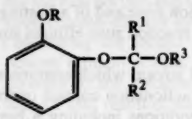
**4,129,601**

## PYROCATECHOL DERIVATIVES

**Karl Kiehs, Lampertheim, and Rolf Huber, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen am Rhein, Fed. Rep. of Germany**

**Continuation-in-part of Ser. No. 409,309, Oct. 24, 1973, abandoned, and Ser. No. 409,330, Oct. 24, 1973, abandoned. This application Aug. 2, 1976, Ser. No. 710,415**
**Claims priority, application Fed. Rep. of Germany, Oct. 25, 1972, 2252250**
**Int. Cl.² C07C *43/22***
**U.S. Cl. 568—593** **4 Claims**

1. A pyrocatechol bis-ether of the formula



R denotes alkyl of from 1 to 4 carbon atoms which may be substituted with halogen; alkenyl having up to 4 carbon atoms which may be substituted with halogen; alkynyl having up to 5 carbon atoms which may be substituted with halogen; or benzyl;

$R^1$ denotes hydrogen or alkyl of from 1 to 4 carbon atoms;

$R^2$ denotes benzyl or alkyl of from 1 to 3 carbon atoms which may be substituted with halogen, methoxy or ethoxy;

$R^3$ denotes alkyl of from 1 to 4 carbon atoms; cycloalkyl of from 3 to 7 carbon atoms; $\beta$-chlorethyl; methoxyethyl; ethoxyethyl; alkenyl of from 2 to 4 carbon atoms; alkynyl of from 2 to 4 carbon atoms.

---

**4,129,602**

## LIQUID PHASE FLUORINATION PROCESS

**Lawrence P. Sendlak, Tonawanda, N.Y., assignor to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.**

**Filed Sep. 1, 1977, Ser. No. 829,846**
**Int. Cl.[2] C07C *25/04***
**U.S. Cl. 260—651 F** **22 Claims**

1. A process for the preparation of compounds of the formula

$$R_nAr(CF_{w'}X_{p'})_Z$$

comprising contacting compounds of the formula

$$R_nAr(CF_wX_p)_Z$$

in liquid phase, with hydrogen fluoride in the presence of a catalyst selected from the group consisting of pentachlorides and pentafluorides of tantalum, niobium and rhenium

wherein

Ar is aryl;
R is a substituent on the aryl nucleus selected from the group consisting of aryl, substituted aryl, halogen, alkyl, alkoxy, and substituted alkyl;
n is 0 to 9;
X is a halogen atom other than fluorine;
w is 0 to 2;
p is 1 to 3;
w' is 1 to 3, and is greater than w;
p' is 0 to 2, and is less than p';
w + p is 3;
w' + p' is 3;
Z is 1–10; and
the maximum value of n + Z is 10.

---

**4,129,603**

## MANUFACTURE OF HALOGENATED COMPOUNDS

**Stephen L. Bell, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England**

**Filed Feb. 7, 1978, Ser. No. 875,935**
**Int. Cl.[2] C07C *17/20***
**U.S. Cl. 260—653** **14 Claims**

1. A process for the manufacture of 1,1,1,2-tetrafluoroethane which comprises reacting in the vapour phase at elevated temperature a haloethane of formula $CX_3CH_2Y$ wherein X is bromine, chlorine or fluorine and Y is chlorine with hydrogen fluoride in the presence of a catalyst which is chromium oxide or which is at least in part basic chromium fluoride and wherein the 1,1,1,2-tetrafluoroethane product containing 1,1-difluoro-2-chloroethylene as impurity is intimately contacted with a metal permanganate in a liquid medium whereby said haloethylene content is reduced.

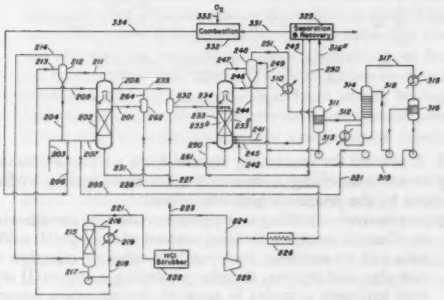
---

**4,129,604**

## REACTOR EFFLUENT QUENCH SYSTEM

**Utah Tsao, Jersey City, N.J., assignor to The Lummus Company, Bloomfield, N.J.**

**Division of Ser. No. 238,196, Mar. 27, 1972, Pat. No. 3,968,200.**
**This application May 14, 1976, Ser. No. 686,278**
**Int. Cl.[2] C07C *21/02***
**U.S. Cl. 260—656 R** **3 Claims**



1. In the production of chlorinated hydrocarbons, a process for recovering hydrogen chloride, comprising:

(a) contacting in a first reaction zone a salt mixture comprising a multivalent metal chloride in its higher and lower valent state with gaseous molecular oxygen and an aqueous solution of hydrogen chloride to produce the corresponding oxychloride and recover chlorine values from the hydrogen chloride by enriching the higher valent metal chloride content of the salt mixture;

(b) contacting the salt mixture from step (a) in a second reaction zone with a $C_1$ to $C_4$ hydrocarbon, and a member selected from the group consisting of chlorine, hydrogen chloride and mixtures thereof to produce a gaseous reaction effluent comprising chlorinated hydrocarbon, water vapor and hydrogen chloride;

(c) separating an aqueous solution of hydrogen chloride from said gaseous reaction effluent;

(d) passing aqueous hydrogen chloride from step (c) to step (a) as a portion of said aqueous solution of hydrogen chloride;

(e) withdrawing a gas containing unreacted hydrogen chloride and water vapor from the first reaction zone;

(f) contacting gas withdrawn from the first reaction zone in a first quench zone with an aqueous hydrogen chloride quench liquid to cool said gas, said contacting partially vaporizing said quench liquid to produce a remaining aqueous hydrogen chloride liquid having a hydrogen chloride concentration greater than the hydrogen chloride concentration of said quench liquid;

(g) introducing said remaining aqueous hydrogen chloride liquid into said first reaction zone as a further portion of said aqueous solution of said hydrogen chloride;

(h) further cooling cooled gas from said first quench zone in a second quench zone to produce aqueous hydrogen chloride having a hydrogen chloride concentration of from about 8% to about 20%, by weight; and

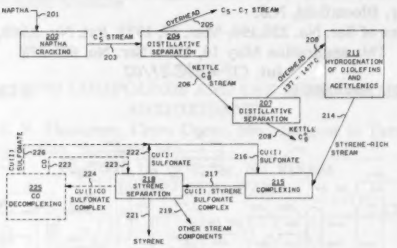
(i) passing aqueous hydrogen chloride from said second quench zone to said first quench zone as said aqueous hydrogen chloride quench liquid.

## 4,129,605

## RECOVERING STYRENE BY COMPLEXING WITH COPPER(I) SULFONATES

**Donald C. Tabler, and Marvin M. Johnson, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed Jan. 28, 1977, Ser. No. 763,460**
**Int. Cl.[2] C07C 15/10, 7/08**
**U.S. Cl. 260—669 A** **24 Claims**




1. A process for recovering styrene from a styrene-containing stream comprising styrene and other close-boiling hydrocarbons by the process which comprises:

(a) extractively distilling said styrene-containing stream with an effective complex-forming amount of a copper(I) sulfonate salt in aromatic hydrocarbon solution effective to complex said styrene, thereby producing a copper(I) styrene sulfonate complex in aromatic hydrocarbon stream, and substantially stripping off said close-boiling hydrocarbons during said extractive distillation,

(b) heating said copper (I) styrene sulfonate complex in aromatic hydrocarbon stream under thermal decomplexing conditions, thereby decomplexing said copper(I) styrene sulfonate complex and recovering said styrene as a styrene stream, and said copper(I) sulfonate as a solution in said aromatic hydrocarbon, and

(c) recycling said copper(I) sulfonate in aromatic hydrocarbon solution from said heating step (b) to said extractively distilling step (a).

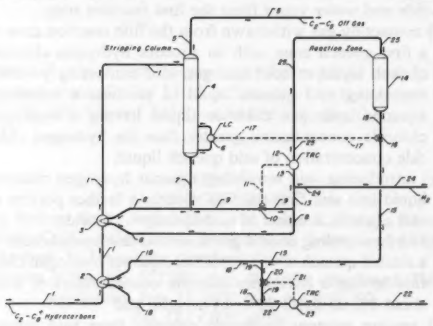
---

## 4,129,606

## TEMPERATURE CONTROL OF INTEGRATED FRACTIONATION COLUMN AND REACTION ZONE

**Steve A. Gewartowski, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.**

**Continuation-in-part of Ser. No. 762,220, Jan. 24, 1977, Pat. No. 4,053,367, which is a continuation-in-part of Ser. No. 717,978, Aug. 26, 1976, Pat. No. 4,024,026. This application Aug. 22, 1977, Ser. No. 826,909**
**Int. Cl.[2] C07C 7/01, 5/24**
**U.S. Cl. 260—674 R** **7 Claims**




1. A method for controlling the temperature of a fractionation column effluent stream as the effluent stream is being passed into a hydrotreating reaction zone and of adjusting the temperature of the hydrotreating reaction zone effluent stream which comprises the steps of:

(a) passing a hydrocarbon feed stream which comprises $C_2$ to $C_8$ hydrocarbons into a fractionation column operated at effective fractionation conditions including a bottom temperature above a maximum desired inlet temperature of a downstream hydrotreating reaction zone, and effecting the removal of $C_2$ to $C_5$ hydrocarbons from the hydrocarbon feed stream by fraction to thereby produce a fractionation column effluent stream having a first temperature which is above an instantaneous preselected inlet temperature for said reaction zone;

(b) cooling the fractionation column effluent stream to a second temperature by dividing the fractionation column effluent stream into a first portion and a second portion, cooling the second portion by indirect heat exchange against the hydrocarbon feed stream, and then recombining the first portion and the second portion of the fractionation column effluent stream;

(c) measuring the second temperature of the fractionation column effluent stream, and comparing the second temperature to the instantaneous preselected inlet temperature for said reaction zone;

(d) adjusting the relative flow rates of the first portion and the second portion of the fractionation column effluent stream in a manner which changes the second temperature of the fractionation column effluent stream to the instantaneous preselected inlet temperature for said reaction zone;

(e) passing the fractionation column effluent stream through said reaction zone at hydrocarbon conversion conditions to produce a hydrotreating reaction zone effluent stream having a first temperature;

(f) cooling said reaction zone effluent stream to a second temperature by dividing said reaction zone effluent stream into a first portion and a second portion, cooling the second portion by indirect heat exchange against the hydrocarbon feed stream, and then recombining the first portion and the second portion of said reaction zone effluent stream;

(g) measuring the second temperature of said reaction zone effluent stream, and comparing the second temperature to the instantaneous preselected inlet temperature of a downstream unit operation; and,

(h) adjusting the relative flow rates of the first portion and the second portion of said reaction zone effluent stream in a manner which changes the second temperature of said reaction zone effluent stream to the instantaneous preselected inlet temperature of the downstream unit operation.

4. A method for controlling the temperature of a fractionation column effluent stream as the effluent stream is being passed into a hydrotreating reaction zone and of adjusting the temperature of the hydrocarbon stream being fed to the fractionator column which comprises the steps of:

(a) measuring the existing temperature of a hydrocarbon feed stream which comprises $C_2$ to $C_8$ hydrocarbons as the hydrocarbon feed stream is being passed into a fractionation column operated at effective fractionation conditions including a bottom temperature above a desired inlet temperature of a downstream hydrotreating reaction zone, and effecting the removal of $C_2$ to $C_5$ hydrocarbons from the hydrocarbon feed stream by fractionation to thereby produce a fractionation column effluent stream having a first temperature which is above an instantaneous preselected inlet temperature for said hydrotreating reaction zone;

(b) cooling the fractionation column effluent stream to a second temperature by dividing the fractionation column effluent stream into a first portion and a second portion, cooling the second portion by indirect heat exchange against the hydrocarbon feed stream, and then recombin-

ing the first portion and the second portion of the fractionation column effluent stream;

(c) measuring the second temperature of the fractionation column effluent stream, and comparing the second temperature to the instantaneous preselected inlet temperature for said reaction zone;

(d) adjusting the relative flow rates of the first portion and the second portion of the fractionation column effluent stream in a manner which changes the second temperature of the fractionation column effluent stream to the instantaneous preselected inlet temperature for said reaction zone;

(e) passing the fractionation column effluent stream through said reaction zone at hydrocarbon conversion conditions to produce a hydrotreating reaction zone effluent stream;

(f) dividing said reaction zone effluent stream into a first portion and a second portion, heat exchanging the second portion against the hydrocarbon feed stream and thereby heating the hydrocarbon feed stream, and then recombining the first portion and the second portion of said reaction zone effluent stream;

(g) comparing the existing temperature of the hydrocarbon feed stream to a preselected inlet temperature for the hydrocarbon feed stream; and,

(h) adjusting the relative flow rates of the first portion and the second portion of said reaction zone effluent stream in a manner which changes the existing temperature of the hydrocarbon feed stream as determined in step (a) to the preselected inlet temperature of the hydrocarbon feed stream entering the fractionation column.

6. A method for controlling the temperature of a fractionation column effluent stream as the effluent stream is being passed into an isomerization reaction zone and of adjusting the temperature of an isomerization reaction zone effluent stream which comprises the steps of:

(a) passing a hydrocarbon feed stream which comprises $C_2$ to $C_8$ hydrocarbons into a fractionation column operated at effective fractionation conditions including a bottom temperature above a maximum desired inlet temperature of a downstream isomerization reaction zone, and effecting the removal of $C_2$ to $C_5$ hydrocarbons from the hydrocarbon feed stream by fractionation to thereby produce a fractionation column effluent stream having a first temperature which is above an instantaneous preselected inlet temperature for said reaction zone;

(b) cooling the fractionation column effluent stream to a second temperature by dividing the fractionation column effluent stream into a first portion and a second portion, cooling the second portion by indirect heat exchange against the hydrocarbon feed stream, and then recombining the first portion and the second portion of the fractionation column effluent stream;

(c) measuring the second temperature of the fractionation column effluent stream, and comparing the second temperature to the instantaneous preselected inlet temperature for said reaction zone;

(d) adjusting the relative flow rates of the first portion and the second portion of the fractionation column effluent stream in a manner which changes the second temperature of the fractionation column effluent stream to the instantaneous preselected inlet temperature for said reaction zone;

(e) passing the fractionation column effluent stream through said reaction zone at hydrocarbon conversion conditions to produce an isomerization reaction zone effluent stream having a first temperature;

(f) cooling said reaction zone effluent stream to a second temperature by dividing said reaction zone effluent stream into a first portion and a second portion, cooling the second portion by indirect heat exchange against the hydrocarbon feed stream, and then recombining the first portion and the second portion of said reaction zone effluent stream;

(g) measuring the second temperature of said reaction zone effluent stream, and comparing the second temperature to the instantaneous preselected inlet temperature of a downstream unit operation; and,

(h) adjusting the relative flow rates of the first portion and the second portion of said reaction zone effluent stream in a manner which changes the second temperature of said reaction zone effluent stream to the instantaneous preselected inlet temperature of the downstream unit operation.

7. A method for controlling the temperature of a fractionation column effluent stream as the effluent stream is being passed into an isomerization reaction zone and of adjusting the temperature of the hydrocarbon stream being fed to the fractionator column which comprises the steps of:

(a) measuring the existing temperature of a hydrocarbon feed stream which comprises $C_2$ to $C_8$ hydrocarbons as the hydrocarbon feed stream is being passed into a fractionation column operated at effective fractionation conditions including a bottom temperature above a desired inlet temperature of a downstream isomerization reaction zone, and effecting the removal of $C_2$ to $C_5$ hydrocarbons from the hydrocarbon feed stream by fractionation to thereby produce a fractionation column effluent stream having a first temperature which is above an instantaneous preselected inlet temperature for said isomerization reaction zone;

(b) cooling the fractionation column effluent stream to a second temperature by dividing the fractionation column effluent stream into a first portion and a second portion, cooling the second portion by indirect heat exchange against the hydrocarbon feed stream, and then recombining the first portion and the second portion of the fractionation column effluent stream;

(c) measuring the second temperature of the fractionation column effluent stream, and comparing the second temperature to the instantaneous preselected inlet temperature for said reaction zone;

(d) adjusting the relative flow rates of the flow portion and the second portion of the fractionation column effluent stream in a manner which changes the second temperature of the fractionation column effluent stream to the instantaneous preselected inlet temperature for said reaction zone;

(e) passing the fractionation column effluent stream through said reaction zone at hydrocarbon conversion conditions to produce an isomerization reaction zone effluent stream;

(f) dividing said reaction zone effluent stream into a first portion and a second portion, heat exchanging the second portion against the hydrocarbon feed stream and thereby heating the hydrocarbon feed stream, and then recombining the first portion and the second portion of said reaction zone effluent stream;

(g) comparing the existing temperature of the hydrocarbon feed stream to a preselected inlet temperature for the hydrocarbon feed stream; and,

(h) adjusting the relative flow rates of the first portion and the second portion of said reaction zone effluent stream in a manner which changes the existing temperature of the hydrocarbon feed stream as determined in step (a) to the preselected inlet temperature of the hydrocarbon feed stream entering the fractionation column.

---

**4,129,607**

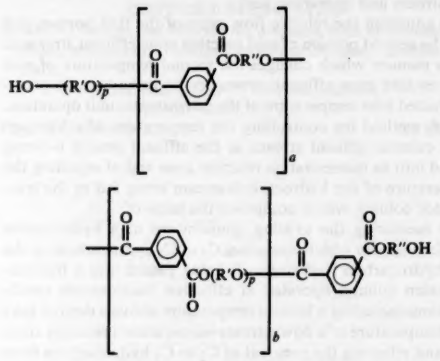
## HOT MELT ADHESIVE HAVING BOTH HIGH PEEL AND TENSILE SHEAR STRENGTH

**John H. Kooi, La Grange Park; Ralph M. Schure, Darien, and John M. Brown, Chicago, all of Ill., assignors to Unitech Chemical Inc., Chicago, Ill.**

**Filed May 31, 1977, Ser. No. 802,079**
**Int. Cl.[2] C08L *63/00***
**U.S. Cl. 260—835** **11 Claims**

1. A hot melt thermoplastic adhesive having both high peel and tensile shear strength, which comprises a blend of a 1,2-epoxy resin with a hydroxy-terminated poly(ester/ether) block copolymer of the formula (I):

(I)



wherein R′ and R″ are alkyl, alicyclic, acyclic, aryl, or arylalkyl of from 2 to 12 carbon atoms, *p* is a number of from 2.4 to 136.0, a is a number such that the "hard" segment within the first set of brackets makes up about 70 to 20 percent by weight of the copolymer, and b is a number such that the "soft" segment within the second set of brackets makes up about 30 to 80 percent by weight of the copolymer, said adhesive having the epoxy resin present in an amount of about 5 to about 50 weight percent and the copolymer present in an amount of about 50 to 95 weight percent of the blend.

---

**4,129,608**

**MULTI-COMPONENT GRAFT COPOLYMER AND THERMOPLASTIC RESIN COMPOSITION THEREOF**

**Naohiro Murayama; Kenichi Nakamura, and Shunzo Endo, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Feb. 9, 1977, Ser. No. 767,022**

**Claims priority, application Japan, Mar. 9, 1976, 51-24644; Sep. 7, 1976, 51-106984; Nov. 30, 1976, 51-143746**

**Int. Cl.[2] C08L *63/00***

**U.S. Cl. 260—836** **8 Claims**

1. A multi-component graft copolymer which comprises 50 to 80 wt. parts of an elastic component produced by an emulsion polymerization of 100 to 70 wt.% of a $C_{2\text{-}12}$ alkyl acrylate and 0 to 30 wt.% of a comonomer having a single vinyl or vinylidene group and 50 to 20 wt. parts of a graft polymerized component produced by a graft-polymerization of 5 to 90 wt.% of a vinyl monomer having a glycidyl group and 95 to 10 wt.% of a lower alkyl acrylate, styrene, α-methyl styrene, methacrylonitrile, or acrylonitrile on the elastic component.

---

**4,129,609**

**METHOD FOR IMPROVING STORAGE STABILITY OF EPOXY ESTER THERMOSETTING RESINS WITH THIURAM COMPOUNDS**

**Toshio Awaji, Amagasaki, and Daisuke Atobe, Suita, both of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan**

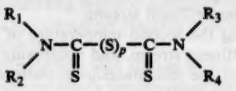
**Filed Jul. 11, 1977, Ser. No. 814,480**

**Claims priority, application Japan, Jul. 12, 1976, 51-82020**

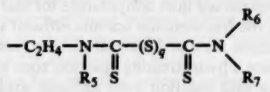
**Int. Cl.[2] C08L *63/00***

**U.S. Cl. 260—837 R** **47 Claims**

1. A method for improving storage stability of a thermosetting resin, which comprises a adding thiuram compound to the thermosetting resin comprising a reaction product of a 1,2-epoxy resin with an α, β-unsaturated monocarboxylic acid dissolved in a polymerizable olefinic unsaturated compound, said thiurum compound having the formula selected from the group having the formula:



wherein p is an integer of 1 through 4, $R_1$, $R_2$ and $R_3$ are alkyl of 1 to 4 carbon atoms or phenyl, and $R_4$ is alkyl of 1 to 4 carbon atoms, phenyl or



wherein q is an integer of 1 to 4, $R_5$, $R_6$ and $R_7$ are alkyl of 1 to 4 carbon atoms or phenyl, provided that where $R_1$ and $R_2$ are joined, and $R_3$ and $R_4$ are joined, said joined groups are selected from the group consisting of pentamethylene and diethyleneoxy and being used in an amount of 0.0001 to 2.0 parts by weight per 100 parts by weight of said reaction product.

---

**4,129,610**

**WATER-SOLUBLE COATING COMPOSITION FOR SHIP BOTTOMS**

**Kengo Kobayashi; Masayuki Mogami; Shigeyoshi Tanaka, all of Hitachi; Manabu Nakao; and Sadao Tamura, both of Hiroshima, all of Japan, assignors to Hitachi Chemical Co., Ltd. and Chugoku Marine Paints, Ltd.**

**Filed Oct. 22, 1976, Ser. No. 735,031**

**Claims priority, application Japan, Oct. 23, 1975, 50-128029**

**Int. Cl.[2] C08L *63/02, 63/10***

**U.S. Cl. 260—837 R** **12 Claims**

1. A water-soluble coating composition for coating ship bottoms comprising

(A) 70–95 parts by weight of a vinyl copolymer of

(a) 5–40% by weight of one monoethylenic unsaturated monomer having at least one basic nitrogen atom, selected from the group consisting of aminoalkyl ester, alkylaminoalkyl ester, or dialkylaminoalkyl ester of acrylic acid or methacrylic acid,

(b) 5–40% by weight of another monoethylenic unsaturated monomer having at least one amide group, and

(c) at least one monoethylenic unsaturated monomer copolymerizable with the components (a) and (b), a total of the components (a), (b), and (c) being 100% by weight, and

(B) 30–5 parts by weight of a water-soluble epoxy resin compound.

---

**4,129,611**

**THERMOPLASTIC POLYURETHANES OF MIXTURES OF HARD AND SOFT THERMOPLAST POLYMERS**

**Herbert L. Heiss, New Martinsville, W. Va., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.**

**Continuation-in-part of Ser. No. 121,652, Mar. 8, 1971, abandoned. This application Dec. 9, 1974, Ser. No. 531,026**

**Int. Cl.[2] C08L *75/04, 75/06, 75/08***

**U.S. Cl. 260—858** **13 Claims**

1. A physical thermoplastic mixture of polyurethane polymers which comprises (A) from about 10% to about 90% by weight of a soft thermoplastic polymer prepared by reacting at an NCO to active hydrogen atom ratio of from about 0.9/1 to about 1.1/1 (1) an organic isocyanate having an average functionality of about 2 with (2) an organic compound or compounds containing active hydrogen atoms and having an average functionality of about 2 and an average equivalent weight greater than 200 and (B) from about 90 to about 10% by weight of a hard thermoplastic polymer prepared by reacting at an NCO to active hydrogen ratio of from about 0.9/1 to about

1.2/1 (1) an organic diisocyanate having an average functionality of from about 1.90 to about 2.20 with (2) an organic compound or compounds containing active hydrogen atoms and having an average functionality of about 2 and an average equivalent weight less than 100.

---

**4,129,612**

## 1,1,3,4,6-PENTAMETHYL-3-(3,5-DIMETHYL-4-HYDROXYPHENYL)-INDAN-5-OL POLYCARBONATES

**Volker Serini; Gerhard Friedhofen; Dieter Frietag, and Jürgen Heuser, all of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany**

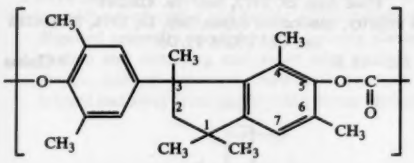
**Filed Mar. 28, 1977, Ser. No. 782,205**

**Claims priority, application Fed. Rep. of Germany, Apr. 7, 1976, 2615038**

**Int. Cl.² C08L *69/00;* C08G *63/62***

**U.S. Cl. 260—860** **19 Claims**

1. Aromatic, thermoplastic polycarbonates, characterized in that they contain 0.5 to 100 mol % of carbonate units of the formula (1)



(1)

---

**4,129,613**

## THERMALLY STABLE HIGH MOLECULAR WEIGHT ACYL PEROXYCARBONIC ESTERS IN POLYESTER CURING

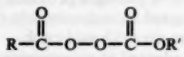
**Roger N. Lewis, Martinez; Ronald L. Pastorino, Larkspur, and James F. Wilts, Richmond, all of Calif., assignors to Argus Chemical Corporation, Brooklyn, N.Y.**

**Continuation-in-part of Ser. No. 696,463, Jun. 16, 1976, Pat. No. 4,051,310. This application Jul. 21, 1977, Ser. No. 817,634**

**Int. Cl.² C08L *67/06***

**U.S. Cl. 260—861** **9 Claims**

1. A process for the curing of polyester resins comprising subjecting ethylenically unsaturated polyester resin and cross-linkable monomer to cross-linking conditions in the presence of a cross-linking initiating amount of an acyl peroxycarbonic ester of the formula:



where R is selected from methyl and ethyl; and R′ is an alkyl group which together with R contains a total of 17 to about 25 carbon atoms.

---

**4,129,614**

## THERMOPLASTIC MOLDING COMPOSITION OF POLYMETHYL METHACRYLATE AND RUBBER MODIFIED STYRENE-MALEIMIDE

**Ronald A. Fava, Monroeville, Pa., assignor to ARCO Polymers, Inc., Philadelphia, Pa.**

**Filed Dec. 23, 1977, Ser. No. 863,962**

**Int. Cl.² C08L *33/12, 35/06, 53/02***

**U.S. Cl. 260—876 B** **3 Claims**

1. A thermoplastic molding composition which comprises:

A. from about 20% to about 80% by weight of polymethyl methacrylate;

B. from about 20% to about 80% by weight of a copolymer of three components:

(aa) a rubbery block polymer prepared in a stereospecific system using from 5 to 35% vinyl aromatic compound and from 65 to 95% conjugated alkadiene, said rubbery block copolymer constituting from 5% to 35% of the copolymer of three components.

(bb) an imide derivative of an ethylenically unsaturated dicarboxylic acid constituting from 5% to 35% of the copolymer of three components, and

(cc) vinyl aromatic composition constituting from 60% to 90% of the copolymer of three components.

---

**4,129,615**

## PLASTIC ALLOY OF COPOLYMERS

**Ronald A. Fava, Monroeville, Pa., assignor to ARCO Polymers, Inc., Philadelphia, Pa.**

**Filed Dec. 23, 1977, Ser. No. 863,963**

**Int. Cl.² C08L *33/12, 35/06, 53/02***

**U.S. Cl. 260—876 B** **2 Claims**

1. Thermoplastic molding composition consists essentially of a blend of:

A. 20–80% by weight of a copolymer comprising methyl methacrylate and vinyl aromatic compound containing from 20% to 80% of methyl methacrylate and from 20% to 80% of vinyl aromatic compound; and

B. from about 20% to about 80% by weight of a copolymer comprising:

(aa) an imide derivative of an ethylenically unsaturated dicarboxylic acid constituting from 5% to 35% of the copolymer of B; and

(bb) vinyl aromatic compound constituting from 60% to 95% of the copolymer of B;

---

**4,129,616**

## POLYMERIC COMPOSITIONS CONTAINING BROMINATED FLAME RETARDANTS

**Steven C. Zingheim, Mountain View, Calif., assignor to Raychem Corporation, Menlo Park, Calif.**

**Continuation-in-part of Ser. No. 806,676, Jun. 15, 1977, abandoned. This application Aug. 29, 1977, Ser. No. 828,731**

**Int. Cl.² C08J *3/24, 5/00;* C08F *255/02;* C08L *23/06***

**U.S. Cl. 260—878 R** **36 Claims**

1. A composition which can be cross-linked by heating, and which comprises:

(a) a polymer which can be cross-linked with the aid of an organic peroxide said polymer comprising at least 40% by weight of said composition;

(b) an organic peroxide;

(c) a compound which contains carbon-carbon unsaturation and which cooperates with said peroxide, when the composition is heated, to promote cross-linking of said polymer; and

(d) a bromine-containing organic flame retardant said flame retardant being present in said composition in an amount not greater than 35% by weight; the ratio by weight of the unsaturated compound (c) to the peroxide (b) being at least 1.2:1.

13. A process for the production of a shaped article of a cross-linked polymer composition, which process comprises:

(1) melt-shaping a composition which comprises:

(a) a polymer which can be cross-linked with the aid of an organic peroxide said polymer comprising at least 40% by weight of said composition;

(b) an organic peroxide;

(c) a compound which contains carbon-carbon unsaturation, which cooperates with said peroxide, when the composition is heated, to promote cross-linking of said polymer; and

(d) a bromine-containing flame retardant said flame retardant being present in said composition in an amount not greater than 35%; said melt-shaping being carried out under conditions such that cross-linking of said composition is substantially prevented; and

(2) heating said melt-shaped composition to effect cross-linking of the polymer; the absolute and relative amounts of

said peroxide (b) and said compound (c) being such that the shaped article has an IPCEA water absorption of less than 3% and an $M_{100}$ value of at least 40.

---

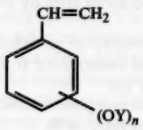
4,129,617

## FLUORO CARBON GRAFT COPOLYMER AND PROCESS FOR THE PRODUCTION THEREOF

Sueo Machi; Yasushi Matsui; Akio Sugishita; Takanobu Sugo; Hiroaki Taniguchi, all of Takasaki; Koichi Asano, Tokyo, and Hiroshi Fujiwara, Soka, all of Japan, assignors to Japan Atomic Energy Research Institute, Tokyo and Maruzen Oil Company Limited, Osaka, both of, Japan

Continuation-in-part of Ser. No. 691,433, Jun. 1, 1976, abandoned. This application Nov. 7, 1977, Ser. No. 849,442
Claims priority, application Japan, Jun. 9, 1975, 50-69363
Int. Cl.[2] C08L *27/12, 27/16, 27/18*
U.S. Cl. 260—879 18 Claims

1. A novel graft copolymer comprising a backbone chain of fluoropolymer and side chains grafted thereon consisting essentially of at least one member selected from the group consisting of hydroxystyrenes having the generic formula:




wherein Y represents a hydrogen atom or a group having the formula

wherein R is a hydrocarbon group, and n represents an integer of 1 or 2, said fluoropolymer being a fluorocarbon polymer or copolymer in which at least one of the monomers thereof is a fluorocarbon.

---

4,129,618

## TETRAFLUOROETHYLENE POLYMERS

John M. Downer, Harpenden; William G. Rodway, Welwyn, and Lawrence S. J. Shipp, Stevenage, all of England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 510,571, Sep. 30, 1974, Pat. No. 4,038,231. This application Dec. 30, 1976, Ser. No. 755,843
Claims priority, application United Kingdom, May 16, 1974, 21748/74
Int. Cl.[2] C08L *27/18*
U.S. Cl. 260—884 2 Claims

1. A tetrafluoroethylene polymer powder suitable for extrusion containing at least 98% of polymerised tetrafluoroethylene and polymerised therewith at least one coplymerisable monomer selected from perfluoroalkyl trifluoroethylens and perfluoroalkoxy trifluoroethylenes each having from 3 to 10 carbon atoms, said powder being composed of particles having inner core and outer shell portions in which the weight concentration of copolymerised monomer present in the outer shell portion (relative to the weight concentration of tetrafluoroethylene with which it is copolymerized) is less than half that of the inner core portion and characterised in that the extrusion pressure of the powder is at least 50 $MN/m^2$, said extrusion pressure being measured at 30° C. with a ram speed of 2.03 cm per minute at a reduction ratio of 282:1 wherein the extradate is a mixture of the powder and a hydrocarbon lubricant which mixture contains 16 percent by weight of the hydrocarbon lubricant, said lubricant having a viscosity of 1.31 cP and a boiling range of 1.71° C. to 1.91° C.

4,129,619

## MOLDABLE BLEND OF POLYMETHYL METHACRYLATE AND STYRENE-MALEIMIDE

Ronald A. Fava, Monroeville, Pa., assignor to ARCO Polymers, Inc., Philadelphia, Pa.

Filed Dec. 23, 1977, Ser. No. 863,964
Int. Cl.[2] C08L *33/12, 35/06*
U.S. Cl. 260—901 6 Claims

1. A molding composition suitable for thermoplastic molding operations which comprises a blend of:
(a) 10–90% by weight polymethyl methacrylate;
(b) 10–90% by weight of the copolymer derived by copolymerizing from about 5% to about 35% imide derivative of an ethylenically unsaturated dicarboxylic acid, and from about 65% to about 95% vinyl aromatic composition.

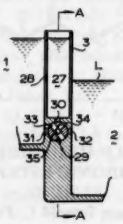
---

4,129,620

## FUEL CHANGEOVER SYSTEM FOR MULTI-FUEL ENGINES

Motoaki Etoh, Ageo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 29, 1977, Ser. No. 828,548
Claims priority, application Japan, Sep. 10, 1976, 51-109185
Int. Cl.[2] F02M *13/06*
U.S. Cl. 261—18 R 3 Claims




1. Fuel changeover system for multi-fuel engines comprising
wall means forming a first float chamber for lighter fuel and a second float chamber for heavier fuel,
a lighter fuel reservoir provided adjacent to said first float chamber,
a passage communicating said lighter fuel reservoir with said lighter fuel float chamber at a level higher than the level of heavier fuel in said heavier fuel float chamber,
a cock provided for regulation of both of the fuels,
first and second valve passages provided in said cock,
a first passage adapted to communicate the bottom of said lighter fuel reservoir with said cock,
a second passage adapted to communicate said lighter fuel float chamber with said cock,
a third passage adapted to communicate said heavier fuel float chamber with said cock,
said second valve passage being adapted to communicate said second and third passages with each other, and
a passage for communicating said first valve passage in the cock with the nozzle of carburetor.

---

4,129,621

## VOLATILE ANESTHETIC VAPORIZING APPARATUS

Wilfred Jones, Keighley, England; Keith W. Jones, Lancaster, N.Y., and Travers F. Sweatman, Toronto, Canada, assignors to Cyprane North America, Inc., Tonawanda, N.Y.

Division of Ser. No. 646,007, Jan. 2, 1976, Pat. No. 4,067,935. This application Sep. 21, 1977, Ser. No. 835,425
Int. Cl.[2] B01F *3/04;* A61M *17/00*
U.S. Cl. 261—39 R 10 Claims

1. Vaporizing apparatus for a volatile anesthetic including:
a body forming a container for liquid anesthetic wherein such liquid can be vaporized by the flow thereby of a gas,

said container having a gas inlet thereto and a gas-anesthetic vapor outlet therefrom,

a bypass chamber for gas not passing through said container and a main inlet to and a main outlet from said bypass chamber for the flow of gas therethrough,

passage means connecting said main inlet to said container gas inlet,

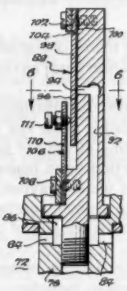
passage means connecting said container gas-anesthetic vapor outlet to said main outlet for mixing of gas-anesthetic vapor with gas passing through said bypass chamber,

valve means for selectively controlling the flow of gas into said bypass chamber to vary the anesthetic concentration of the resultant flow through said main outlet passing from the vaporizer,

a container valve means for controlling the flow of gas through said container, said container valve means comprising:

a housing having a planar surface portion and valve inlet passage means opening into said planar surface portion,

a valve element mounted in a pivoted manner at one location on said valve housing and having a planar surface portion disposed generally parallel to said housing planar surface portion and overlying said valve inlet passage opening therein, said valve element planar surface portion pivoting toward and away from said housing planar surface portion



to variably restrict, in a laminar manner, gas flowing outwardly between said planar surface portions from said valve inlet opening, and

a temperature responsive element mounted at another location on said valve housing in contact with said valve element to pivot said valve element to vary the pressure drop over said container valve means as the temperature in said container varies so as to maintain the anesthetic concentration of gas delivered from said vaporizer substantially constant over a range of temperature conditions.

6. A thermally responsive valve means comprising:

a housing having a planar surface portion and valve inlet passage means opening into said planar surface portion,

a valve element mounted in a pivoted manner at one location on said valve housing and having a planar surface portion disposed generally parallel to said housing planar surface portion and overlying said valve inlet passage opening therein, said valve element planar surface portion pivoting toward and away from said housing planar surface portion to variably restrict, in a laminar manner, fluid flowing therebetween and

a temperature responsive element mounted at another location on said valve housing in contact with said valve element to pivotally control said valve element to vary the pressure drop over said valve means in response to changes in ambient temperature.

**4,129,622**

## CARBURETOR WITH AN ALTITUDE COMPENSATOR

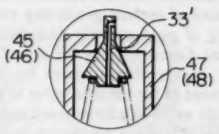
**Tsuyoshi Tamazawa; Masayasu Suematsu, and Hideo Morita, all of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Japan**

**Division of Ser. No. 679,484, Apr. 22, 1976, abandoned. This application Nov. 14, 1977, Ser. No. 851,303**

**Claims priority, application Japan, Apr. 23, 1975, 50-55568; Apr. 23, 1975, 50-55570; May 24, 1975, 50-69885**

**Int. Cl.[2] F02M 7/24**

**U.S. Cl. 261—39 A** **3 Claims**




1. An internal combustion engine carburetor comprising, in combination, means defining an induction passage; means defining a main fuel delivery passage with a main air bleed; means defining a slow fuel delivery passage with a slow air bleed; and means defining an auxiliary air delivery circuit including an altitude compensating apparatus having an aneroid bellows deformable in dependence on the ambient atmospheric pressure, conduit means for passing air to the main and slow fuel delivery passage having two conduits one for each fuel passage, valve means for controlling the volume of air through said conduit means in accordance with the deformation of said aneroid bellows, said valve means having two valve housings and two valve members, one for each of said conduits, respectively accommodated in the two valve housings, and means bypassing said valve means to deliver a predetermined amount of air into said conduit means, said bypassing means including restricted passage means for constant fluid connection of said conduit means to the atmosphere across said valve means.

---

**4,129,623**

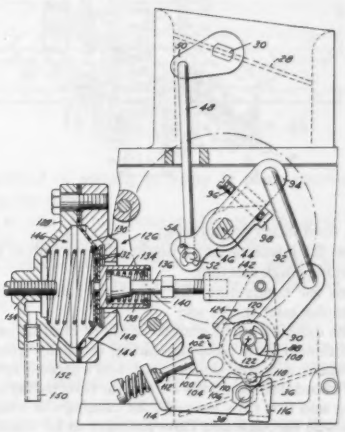
## CARBURETOR WITH FAST IDLE CAM AUTOMATIC RELEASE

**Jerry B. Rogerson, Northville, and Robert S. Harrison, Grosse Ile, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.**

**Filed Jan. 26, 1977, Ser. No. 762,710**

**Int. Cl.[2] F02M 3/06**

**U.S. Cl. 261—52** **6 Claims**



1. A carburetor having an air/fuel induction passage open at

one end to air at essentially atmospheric pressure and connected at its opposite end to an engine intake manifold to be subject to the changing vacuum levels therein, the one end having a choke valve rotatably mounted for movement across the passage between a closed air choking position and an open inoperative position, and a throttle valve rotatably mounted posterior of the choke valve for movement across the passage between a normal engine operating temperature level essentially closed engine idle speed position and beyond towards a wide open throttle position to control the quantity of air/fuel mixture flow through the passage, an abutment means rotatable with the throttle valve, a rotatable fast idle cam having a cammed contoured surface projecting radially from the cam axis and being of progressively decreasing radial extent in a circumferential direction from the axis of rotation of the cam for frictional engagement at times by the abutment means during movement of the throttle valve in a closing direction to stop the throttle valve in a faster more open idle speed position than the normal idle speed position to increase mixture flow to the manifold, the cam being rotatable by gravity towards an inoperative position upon disengagement of the abutment means with the cam surface to permit closure of the throttle valve to the normal idle speed positions, rotatable linkage and lever means operatively connected to the choke valve and cam, the lever means having a portion extending into the path of rotative movement of the fast idle cam linkage during movement of the cam towards the inoperative position to stop the cam rotation, means to rotate the rotatable means, and control means operable while maintaining the abutment means in essentially the same relative position engaged with the fast idle cam surface to automatically effect a linear shifting movement of the axis of the fast idle cam to effect a similar movement of the cam and the abutment means to move the abutment means to a less open throttle position of the abutment means to lean and reduce the mixture flow to the engine to improve emissions while minimizng engine stalling.

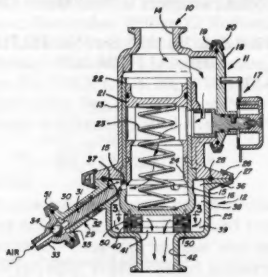
---

**4,129,624**

## FLUID MIXER

**Willard A. Kates, Winnetka, Ill., assignor to The W. A. Kates Company, Deerfield, Ill.**

**Filed May 13, 1977, Ser. No. 796,844**
**Int. Cl.[2] B01F *15/02***
**U.S. Cl. 261—76** **28 Claims**



1. A fluid mixer comprising:
means for injecting into a liquid a fine stream of gas to provide a rough mixture;
means for conducting the liquid-gas rough mixture to an annular inlet space; and
means defining a first annular array of chordal substantially rectilinear flow passages leading inwardly from said inlet space to a central outlet space, and a second annular array of chordal substantially rectilinear flow passages intersecting said first flow passages for causing the rough mixture flowed through said flow passages to be discharged into said central outlet space in intersecting streams whereby the rough mixture is further mixed therein to define a fine mixture of said liquid and gas for delivery from said outlet space.

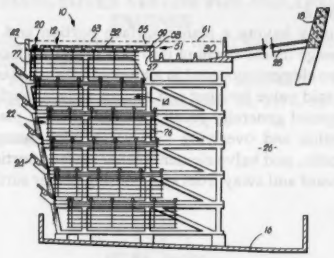
---

**4,129,625**

## SELECTIVELY CONTROLLABLE WATER CURTAIN DAMPER FOR INLET FACE OF CIRCULAR WATER COOLING TOWER

**Homer E. Fordyce, Kansas City, Mo., and William C. Carter, Lenexa, Kans., assignors to The Marley Company, Mission, Kans.**

**Continuation-in-part of Ser. No. 662,560, Mar. 1, 1976, Pat. No. 4,048,265. This application Aug. 1, 1977, Ser. No. 820,453**
**The portion of the term of this patent subsequent to Sep. 13, 1994, has been disclaimed.**
**Int. Cl.[2] F28C *1/04***
**U.S. Cl. 261—111** **10 Claims**



1. A water cooling tower comprising:
a hot water distribution basin having a generally horizontal bottom wall;
fill structure beneath said distribution basin for dispensing hot water gravitating from the latter for enhancing the evaporative cooling of the hot water;
a cold water collection basin beneath said fill structure for collecting cooled water gravitating from the latter;
means for directing ambient derived air currents through said fill structure for cooling of tne hot water gravitating therethrough;
selectively actuable deicing means for deicing the outer margin of said tower, including
horizontal, elongated slot means extending through the bottom wall of the distribution basin at an area of said bottom wall generally parallel to and overlying the outer margin of said tower,
said slot means being configured and arranged for downward delivery of sufficient quantities of hot water therethrough directly onto at least a portion of said outer margin of the tower to effect deicing thereof under cold weather conditions;
elongated, shiftable cover means overlying said slot means in at least partial water flow-blocking disposition thereto; and
selectively actuatable means for shifting said cover means as desired from said flow-blocking disposition to a deicing position permitting free flow delivery of hot water through said slot means, and for selective return of said cover means to said flow-block disposition when deicing of the tower is complete;
an annular, hot water carrying flume disposed horizontally adjacent said distribution basin for delivery of hot water thereto,
said flume being configured to maintain a water level spaced above said bottom wall of the distribution basin; and
means for establishing fluid flow communication between said distribution basin and said flume at an elevation corresponding to the elevation of said bottom wall such that the water in said flume above said bottom wall is available to maintain an adequate water head for providing a flow of hot water through said slot means sufficient to create a

substantially continuous, vertically extending curtain of water along selected portions of said outer margin of the tower whereby air flow therethrough is temporarily blocked to enhance the deicing properties of the hot water.

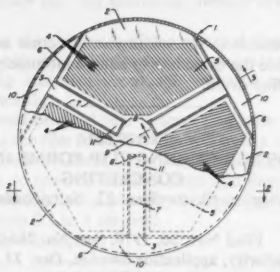
---

**4,129,626**

## VAPOR-LIQUID CONTACTING APPARATUS

**Marvin E. Mellbom, Clarendon Hills, Ill., assignor to UOP Inc., Des Plaines, Ill.**

**Filed Jan. 3, 1978, Ser. No. 866,664**
**Int. Cl.[2] B01D *3/22***
**U.S. Cl. 261—114 JP** **15 Claims**



1. A multi-pass vapor-liquid contacting tray which comprises:

(a) a horizontal liquid support plate having a substantially circular periphery and an upper surface and which is adapted to retain a body of liquid upon the upper surface;

(b) at least three chordal imperforate liquid receiving areas alternately spaced along the periphery of the liquid support plate with an equal number of chordal liquid collection areas, with each chordal liquid collection area and each chordal liquid receiving area having a first and a second end;

(c) a plurality of liquid collection troughs dividing the liquid support plate into a number of vapor-liquid contacting areas, the liquid collection troughs being equal in number to the number of chordal liquid collection areas, with each liquid collection trough extending radially outward to a single chordal liquid collection area, and with each liquid collection trough having an open top which is partially surrounded by two substantially imperforate vertical baffles extending upward from the upper surface of the liquid support plate along two opposing sides of the liquid collection trough; and,

(d) a pair of substantially imperforate vertical walls rising above the upper surface of the liquid support plate and located along a chordal edge of each of the chordal liquid collection areas, with one of the pair of vertical walls extending horizontally from one of the vertical baffles associated with the liquid collection trough which abuts and is in fluid flow communication with the chordal liquid collection area to each of the first and second ends of the chordal liquid collection area, and with the vertical walls extending a greater distance above the upper surface of the liquid support plate than the vertical baffles associated with the liquid collection trough.

---

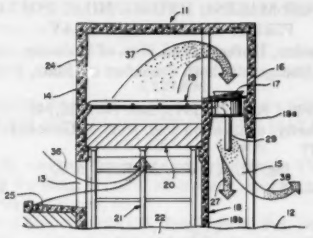
**4,129,627**

## TORNADO PROTECTED COOLING TOWER

**Dale D. Furr, Fort Worth, Tex., assignor to Ceramic Cooling Tower Company, Fort Worth, Tex.**

**Filed Aug. 5, 1977, Ser. No. 822,078**
**Int. Cl.[2] B01F *3/04***
**U.S. Cl. 261—151** **21 Claims**

1. In a tornado protected cooling tower including a plurality of enclosed cooling cells arranged about the periphery of a central opening, each of said cells having a cool air inlet along the outer side thereof opposite said central opening and a warm air outlet along the inner side thereof adjacent said central opening, fan means mounted within said cells, said cells also having a perforate fill material supported therein above said cool air inlet, and water distribution means within said cells above said fill material for applying cooling water thereto to shower downwardly therethrough, and storage basin means beneath such cells for receiving the water discharged therefrom, the improvement comprising providing a plurality of fans mounted within each of said cells along the inner side



thereof adjacent said central opening in direct communication with said warm air outlet, said fans being self-contained vane axial fans having motors as integral components utilizing direct drive, providing each of said cells with inner wall means having an upper apron portion extending downwardly below the lowest component of said fans, said apron portion being horizontally offset inwardly from the remaining portion of said inner wall means and being disposed in generally vertically overlapping relation with respect thereto, and said fans being mounted vertically within each of said cells so as to be supported between said apron portion and the remaining portion of said inner wall.

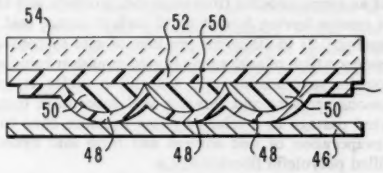
---

**4,129,628**

## METHOD OF MAKING A THERMOPLASTIC LENS BY VACUUM FORMING

**Donald J. Tamutus, Trenton, N.J., assignor to RCA Corporation, New York, N.Y.**

**Filed Jul. 19, 1976, Ser. No. 706,449**
**Int. Cl.[2] B29D *11/00***
**U.S. Cl. 264—1** **6 Claims**




1. A method of making an array of plano-convex lenses comprising the steps of:

placing an array of plano-convex lenses, in the array pattern desired, on a flat surface flat side down;

placing a sheet of thermoplastic material, heated to its softening point over the exposed convex surfaces of the lenses;

creating a vacuum beneath the sheet to thereby cause the sheet to adhere to and assume the shape of the array of lenses, the outer surface of the sheet thereby assuming the final shape desired for the array of lenses;

permitting the sheet to harden;

after the sheet has hardened, removing it from the array of lenses and placing the hardened sheet on a support, convex surfaces down;

filling the concave cavities in the hardened sheet with an optically transparent fluid medium of the type which hardens, upon curing, and which has an index of refraction, when hard, which is substantially equal to that of the sheet; and

curing said medium to thereby harden the same, the surface of said medium, when hard, being adapted to form the plane surface of said array of lenses, and the outer surface of the sheet forming the convex surfaces of the array of lenses.

---

**4,129,629**

## PROCESS FOR MAKING HYDROPHILIC POLYOLEFIN FIBERS CONTAINING CLAY

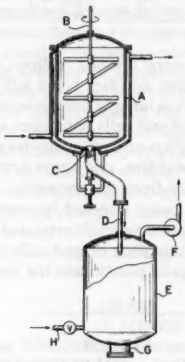
**Wolfgang Gordon, Hofheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

**Filed Nov. 26, 1975, Ser. No. 635,745**

**Claims priority, application Fed. Rep. of Germany, Nov. 28, 1974, 2456277**

**Int. Cl.[2] C08J *3/20;* B29C *6/00***

**U.S. Cl. 264—13** **10 Claims**




1. A process for making hydrophilic clay-containing polyolefin fibers which comprises preparing a suspension of non-pre-hydrophobized clay particles in an emulsion of (a) a solution of a polyolefin in a volatile organic solvent and (b) an aqueous solution of a hydrophilizing agent, said emulsion containing from 0.05 to 5% by weight, based on the weight of clay, of an amine selected from aliphatic, aromatic and alkylaromatic amines having from 4 to 30 carbon atoms, said amine constituting 0.01 to 10 grams per liter of said suspension and the residence time of said amine in said emulsion being at least 10 seconds, superheating said suspension under at least an autogenous pressure and flowing said suspension through a restricted passage to a relatively low pressure zone to cause flash evaporation of said solvent and form said hydrophilic clay-filled polyolefin fibers.

---

**4,129,630**

## PROCESS FOR PRODUCING THERMOPLASTIC RESIN FILMS HAVING REDUCED THICKNESS UNEVENNESS

**Masami Etchu; Takao Yamaguchi, and Norio Takagi, all of Ogaki, Japan, assignors to Teijin Limited, Osaka, Japan**

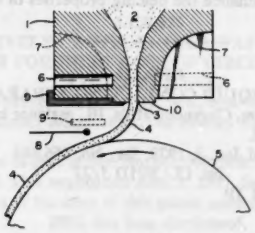
**Filed Mar. 29, 1976, Ser. No. 671,380**

**Claims priority, application Japan, Apr. 1, 1975, 50-38588**

**Int. Cl.[2] B29F *3/08***

**U.S. Cl. 264—22** **6 Claims**

1. In a process for producing a film of reduced thickness unevenness by extruding a thermoplastic resin from an extrusion die into a film form, exposing the extrudate to an electric field induced by a single electrostaticity applying electrode, and then pinning it to the surface of a cooling drum, the improvement comprising disposing a non-grounded shielding object between the extrusion surface of the die and the electrostaticity applying electrode thereby to maintain the applied




voltage constant in the widthwise direction of the extrudate and to enable the extrudate to adhere intimately to the surface of the cooling drum.

---

**4,129,631**

## METHODS FOR GUIDING SLIP-FORMS IN SLIP-FORM CONCRETING

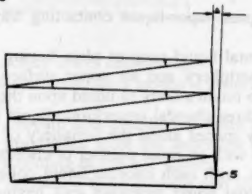
**Nils H. Ahlgren, Skyttevägen 22, Saltsjöbaden, Sweden (S-13300)**

**Filed Nov. 30, 1976, Ser. No. 746,095**

**Claims priority, application Sweden, Dec. 23, 1975, 7514590**

**Int. Cl.[2] E04B *1/16***

**U.S. Cl. 264—33** **8 Claims**




1. A method for guiding rigid slip-forms in the casting of concrete structures, where the rigid slip-form is guided away from one side of the structure being cast; said method comprising in any one lifting sequence of operations, said rigid slip-form being first lifted at a first side of the concrete structure being cast to a new higher position, from which side the slip-form is to be guided away, such that the slip-form when being lifted is shifted towards a second, opposite side; and being then lifted at said second side to said new higher position so that said rigid slip-form is guided away from said first side.

---

**4,129,632**

## METHOD FOR EXTRUDING SLITTING AND FIBRILLATING THERMOPLASTIC FILM TAPES

**Carl B. Olson, San Anselmo; Carl S. Weisner, Pleasant Hill, and Phillip H. Parker, San Rafael, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.**

**Filed Dec. 21, 1977, Ser. No. 862,790**

**Int. Cl.[2] B29D *7/02;* B29C *17/14***

**U.S. Cl. 264—40.1** **20 Claims**

10. A process for preparing thermoplastic fibrillated tapes which comprises the sequential steps of:

(a) extruding a film-forming thermoplastic through a narrow

elongated slot orifice to form a molten film and casting the molten film upon a rotating casting cooling drum to form a film;

(b) trimming the width ends of said film to remove edge beads;

(c) passing said film to an orientation section comprising at least one orientation roll sequence comprising at least one orienting heating roll followed by at least one orienting cooling roll and whereby said film passes over and against said orienting rolls and wherein said orienting heating and cooling rolls are rotated at such relative speeds that the film leaves said orientation section at a speed at least about four times greater than the speed at which it enters the orientation section but below the relative speed stretch ratio at which the film fibrillates, thereby orienting said film;

(d) measuring the thickness of the oriented film across its width and adjusting said slot orifice to provide an oriented film having less than about 3% variation in thickness across its width;

(e) winding said oriented film to form film rolls;

(f) unwinding the film from said film roll over a hot surface, under a tension of about from 2 to 10 pounds per inch of film width, to remove wrinkles from said film;

(g) slitting said film into a plurality of tapes having a width of about from 0.3 to 1 cm; and

(h) fibrillating said tapes.

---

**4,129,633**

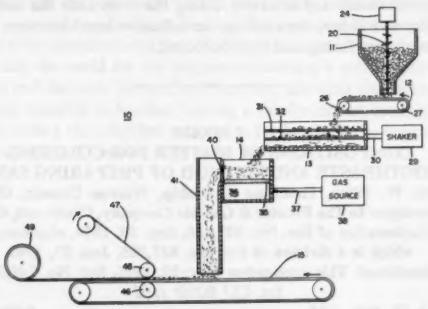
## PROCESS AND APPARATUS FOR MANUFACTURE OF AN ELECTRODE

**Royce E. Biddick, Edina, Minn., assignor to Gould Inc., Mendota Heights, Minn.**

**Continuation of Ser. No. 225,433, Feb. 11, 1972, abandoned. This application Nov. 3, 1975, Ser. No. 627,968**

**Int. Cl.[2] C04B *35/00***

**U.S. Cl. 264—40.3** **11 Claims**




1. The process for manufacture of a continuous electrode comprising:

preparing a bulk electrode material including a hydrophobic binder comprised of sticky electrode material particles;

fluidizing the sticky electrode material particles in a fluid stream by observing sticky electrode particle behavior in a fluid stream and controlling the fluid stream such that particles are maintained in a uniform suspension allowing a uniform flow of sticky electrode particles over a weir onto a moving member to thereby produce a continuous strip of electrode particles; and

then compressing the electrode particles to produce a continuous electrode.

4. The process for manufacture of a continuous electrode comprising:

preparing a bulk electrode mixture including a hydrophobic binder having a predetermined melting temperature, said bulk electrode material characterized by self-adhesion;

first heating the bulk electrode mixture to a temperature below the melting temperature of the hydrophobic binder to drive off unwanted suspension materials in the bulk electrode mixture to thereby produce large lumps of electrode mixture;

breaking up the lumps of electrode mixture to produce self-adhering electrode particles;

fluidizing the self-adhering electrode particles in a fluid stream by observing sticky electrode particle behavior in a fluid stream and controlling the fluid stream such that particles are maintained in a uniform suspension allowing a uniform flow of sticky electrode particles over a weir onto a moving member to thereby produce a continuous strip of self-adhering electrode particles; and

then compressing the electrode particles to produce a continuous self-adhering electrode.

---

**4,129,634**

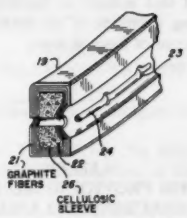
## METHOD FOR PREPARING A COMPOSITE HIGH STRENGTH TO WEIGHT STRUCTURE HAVING SHELL AND SLEEVED CORE

**Andrew M. Cecka, Thousand Oaks; Pol Dano, Camarillo, and Paul G. Pawling, Oxnard, all of Calif., assignors to Fansteel, Inc., North Chicago, Ill.**

**Division of Ser. No. 703,136, Jul. 7, 1976, Pat. No. 4,070,021. This application Nov. 25, 1977, Ser. No. 854,533**

**Int. Cl.[2] B29D *27/00***

**U.S. Cl. 264—45.3** **11 Claims**




1. A method of producing a structural member of high strength to weight ratio comprising inserting an elongated core strip comprising a foamable resin composition within a seamless sleeve made of a thin, flexible cellulosic film, arranging within a mold cavity an outer shell comprising at least one layer of unidirectionally oriented resin-coated graphite fibers in sheet foam and said elongated core within said sleeve with said shell surrounding said core and sleeve, sealing said mold cavity, activating said foamable resin composition to cause expansion thereof and generate pressure within said mold cavity pressing said core within said sleeve against said shell and thereby providing intimate bonding of said core to said shell, and thereafter removing said core and said shell from said mold cavity as an integral composite structure.

---

**4,129,635**

## METHOD FOR PRODUCING FOAMED MOLDINGS FROM SYNTHETIC RESIN MATERIALS

**Akio Yasuike, Yokohama; Hiroshi Kataoka, Tokyo, and Kaoru Toyouchi, Yokohama, all of Japan, assignors to Asahi-Dow Limited, Tokyo, Japan**

**Continuation of Ser. No. 534,134, Dec. 18, 1974, abandoned. This application Jul. 8, 1977, Ser. No. 814,127**

**Claims priority, application Japan, Dec. 28, 1973, 48-1245**

**Int. Cl.[2] B29D *27/00***

**U.S. Cl. 264—45.5** **2 Claims**

1. A method for injection molding of articles having an unexpanded outer layer and an expanded core contained therein; including the steps of

plastifying a foamable resin material without substantial expansion,

injecting a mass of said plastified and substantially unexpanded resin material into a closed mold cavity pre-press-

urized with a first body of gas through an inlet in said mold cavity in an amount less than the volume of said mold cavity,

charging a second body of gas under pressure into said mold cavity through an inlet in said mold cavity to force said injected resin material against the walls of the mold cavity by the pressure of the charged second body of gas, whereby said gas is enclosed by said resin material and

said second body of gas forms a hollow in the mass of said resin and

discharging said second body of gas from said mold cavity when said resin material within the mold cavity sets at least at its outer surface layer so as to permit the expansion of the remaining resin material, other than the set surface layer, to fill said hollow to thereby produce a molded article having a surface of an unexpanded layer of said resin and a core of foamed resin.

---

**4,129,636**

## PROCESS FOR PROVIDING MIXED FOAMABLE REACTANTS TO A MOLD

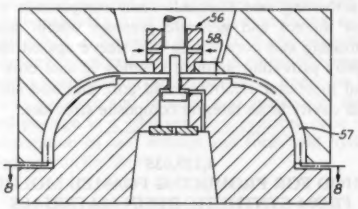
**Heinrich Boden, Opladen, and Ulrich Knipp, Schildgen-Nittum, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Division of Ser. No. 558,515, Mar. 14, 1975, Pat. No. 4,013,391. This application Nov. 18, 1976, Ser. No. 742,937**

**Claims priority, application Fed. Rep. of Germany, Mar. 20, 1974, 2413337**

**Int. Cl.² B29D *27/00***

**U.S. Cl. 264—51** **1 Claim**




1. A process for mixing foamable thermosetting resin reactants and introducing them into a mold comprising introducing said reactants into a mixing chamber through injection apertures in its side wall portion, said mixing chamber having an outlet aperture communicating with the cavity of the mold and prior to the introduction of reactants into the mixing chamber inserting a displacement piston having a smaller cross-section than the outlet aperture of said mixing chamber into said mixing chamber through said outlet aperture such that the injection apertures communicate with the mold cavity by means of a generally annular passage whereby a foamed resin product substantially free of sprue and surface marks is produced.

**4,129,637**

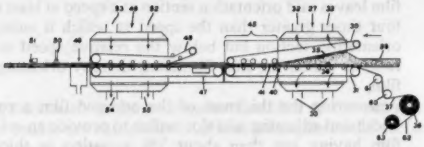
## USE OF AN OPEN POROUS THERMOPLASTIC NETTING AS THE LAMINATING ADHESIVE IN FORMING A MINERAL WOOL FIBERBOARD PRODUCT

**Wayne C. Kennedy, Lititz, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.**

**Filed Jun. 8, 1977, Ser. No. 804,704**

**Int. Cl.² B04H *1/20***

**U.S. Cl. 264—112** **4 Claims**



1. In a method of manufacturing a dry laid mineral wool fiberboard product faced with an open mesh glass fabric wherein fibers and resin binder forming the board product are entrained in an air stream and deposited on two converging forming wires and wherein an open mesh glass fabric is positioned between the lower forming wire and the layer of fibers and resin binder being formed thereover, with the fabric acting as a carrier which becomes adhered to the mineral wool fiberboard after consolidation of the two layers of fibers and resin binder and during oven cure of the resin binder, the improvement comprising: feeding an open weave thermoplastic netting between the open mesh glass fabric and the fibers and resin binder being formed thereover, said thermoplastic netting being of an open porous structure such that air flow through the fabric and netting during the forming operation is not impeded, said netting having a melting point below the oven curing temperature required for curing the resin binder in the mineral fiberboard whereby during the oven cure the netting melts and forms, on cooling, an adhesive bond between the glass fabric facing and the fiberboard.

---

**4,129,638**

## COMPOSITIONS OF MATTER FOR COLORING TOOTHPASTE AND METHOD OF PREPARING SAME

**Lyle W. Ritze, Hamilton Township, Warren County, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio**

**Continuation of Ser. No. 507,636, Sep. 20, 1974, abandoned, which is a division of Ser. No. 837,303, Jun. 27, 1969, abandoned. This application Nov. 22, 1976, Ser. No. 744,078**

**Int. Cl.² B29B *1/02***

**U.S. Cl. 264—117** **5 Claims**

1. A process for preparing agglomerates of pigment particles which comprises the steps of:

(1) melting a wax having a hardness value of from 0 to 65;

(2) uniformly dispersing water-insoluble, non-toxic, colorfast, pigment particles having a mean particle size within the range from about 5 to about 490 microns in the molten wax, said particles being selected from the group consisting of dyed thermosetting resin particles, chromium oxide pigments, carbon blacks, ultramarine blues, ultramarine pinks, ferric oxides, dyed cellulose particles and water insoluble dye lakes;

(3) cooling the wax dispersion of pigment particles to solidification, said solidification yielding the final agglomerates or larger pieces; and

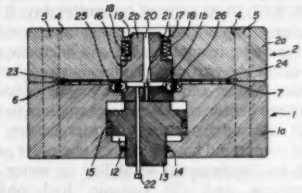
(4) reducing the solid wax dispersion to agglomerates having a mean particle size within the range from about 200 to about 500 microns and a pigment particle concentration of from about 30% to about 50% by weight of the total agglomerates.

## 4,129,639

## METHOD AND APPARATUS FOR MANUFACTURING OPEN END SLIDING CLASP FASTENERS

Riccardo Taccani, Milan, Italy, assignor to Interbrev S. A., Luxembourg, Luxembourg

Filed Oct. 22, 1976, Ser. No. 735,104
Claims priority, application Switzerland, Oct. 23, 1975, 13718/75
Int. Cl.[2] B29D *3/00, 5/00*
U.S. Cl. 264—157 1 Claim



1. In a process for making a separable sliding clasp fastener comprising two halves, each having a band, said band having on its inside edge, a row of interlocking elements of thermoplastic materials, a top stop on each half; a separating device having one female part and two male parts, one on each fastener half and adjacent to the row of interlocking elements and a sliding clasp which, when moved in either direction causes coupling or uncoupling of the two rows of interlocking elements, which comprises the steps of inserting a segment of each of the two disengaged halves of a continuous fastener, said halves having a row of interlocking elements thereon, into a mold having a band reinforcement track and a cavity adjacent thereto in such a manner that the band will be placed above the band reinforcement track and the row of interlocking elements will be housed in the cavity, the cavity being larger than the row itself, said cavity having a band side wall and two walls crosswise to the band being shaped like the male part to be manufactured, injecting molten thermoplastic material into the mold for the purpose of forming a reinforcement band and the male parts of said fastener, allowing the thermoplastic material to harden forming a reinforcement band, and then cutting the solidified material to further form the opposite lateral sides of the two male parts.

---

## 4,129,640

## PROCESS FOR PRODUCING SHAPED ARTICLES OF CELLULOSE

Henry Rodier, Sainte-Foy-les-Lyon, France, assignor to Rhone Poulenc Textile, Paris, France

Filed Jul. 14, 1977, Ser. No. 815,856
Claims priority, application France, Jul. 16, 1976, 76 22031
Int. Cl.[2] C08L *1/24*
U.S. Cl. 264—187 10 Claims

1. Process for producing shaped articles of cellulose, said process comprising contacting a solution of cellulose in DMSO and formaldehyde, containing at least 6% by weight of cellulose based on the volume of DMSO and containing formaldehyde in a weight ratio of formaldehyde/cellulose of 0.2 to 0.6, in said shaped form with a coagulating solution consisting essentially of DMSO and water at a temperature of no greater than 10° C.

## 4,129,641

## METHOD OF SHAPING ETHYLENICALLY UNSATURATED MONOMER SOLUTIONS CONTAINING URYLATED LINEAR POLYESTER/POLYURETHANE RESINS

James Ferrarini, Aston, Pa., and Erich Kuehn, Wilmington, Del., assignors to ICI Americas Inc., Wilmington, Del.

Division of Ser. No. 676,531, Apr. 12, 1976, Pat. No. 4,073,828.
This application Dec. 6, 1977, Ser. No. 857,917
Int. Cl.[2] B29G *1/00;* B29B *1/04;* B29C *3/00;* C08L *75/00*
U.S. Cl. 264—294 5 Claims

1. A process for preparing a tractable shaped article capable of being further shaped and cured into an intractable shaped article, said process comprising the steps of:

(1) preparing a vinylidene monomer solution having dissolved therein an isocyanate terminated linear polyester/-polyurethane resin free of ethylenic unsaturation;

(2) gelling or thickening the vinylidene monomer solution by intermixing it with an organic diamine with sufficient agitation to form a homogeneous mixture;

(3) shaping said mixture and reacting said homogeneous mixture in the absence of substantial polymerization of said vinylidene monomer to obtain a shaped tractable article; and

(4) further shaping the shaped tractable article of Step (3) and polymerizing the vinylidene monomer until said shape becomes intractable.

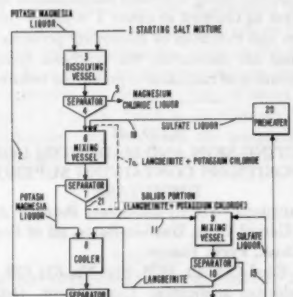
---

## 4,129,642

## PROCESS FOR THE PRODUCTION OF POTASSIUM SULFATE

Ulrich Neitzel, Heringen, Germany, assignor to Kali & Salz AG, Kassel, Germany

Filed Jul. 19, 1977, Ser. No. 816,964
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1976, 2643001
Int. Cl.[2] C01D *5/00, 5/12*
U.S. Cl. 423—199 18 Claims




1. A process for producing potassium sulfate, which comprises:

(a) forming a starting mixture comprising carnallite, potassium chloride, kieserite and residual quantities of less than 15% by weight rock salt by electrostatically separating a ground crude potassium salt;

(b) contacting said starting mixture with a potash magnesia liquor at a temperature of about 20°–40° C. to form a slurry containing up to 70 mole $MgCl_2$/1000 $H_2O$, said contacting resulting in the decomposition of the carnallite

and the dissolution of the rock salt contained in said starting mixture;

(c) separating the slurry formed in step b) into a magnesium chloride solution and a solids portion containing a mixture of kieserite and potassium chloride;

(d) mixing the solids portion obtained in step c) with a sulfate liquor containing 18–45 mole $MgCl_2$/1000 $H_2O$ at a temperature of about 75°–110° C. to convert the solids portion into a mixture of langbeinite and potassium chloride; p1 (e) cooling the mixture obtained in step d) to a temperature between about 15°–60° C. to form slurry containing a potassium-magnesium double sulfate salt and potassium chloride;

(f) separating the slurry formed in step e) into a potash magnesia liquor portion and a double sulfate saltcontaining solids portion;

(g) mixing the solids portion obtained in step f) with water to convert the double sulfate salt contained in said solids portion into potassium sulfate; and

(h) separating the potassium sulfate formed in step g) from the sulfate liquor associated therewith.

---

**4,129,643**

## METHOD FOR RAPID SCREENING OF TERATOGENIC AGENTS

**Ruth M. Clayton, 1, Seton Pl., Edinburgh 9, Scotland**

**Filed Jul. 1, 1977, Ser. No. 812,176**

**Claims priority, application United Kingdom, Jul. 15, 1976, 1546/76**

**Int. Cl.[2] A61K *29/00, 43/00***

**U.S. Cl. 424—1** **7 Claims**

1. A process for screening a compound for teratogenic activity comprising administering the compound being screened to a test animal, removing amniotic fluid from the test animal, using the amniotic fluid removed as at least part of a cell culture medium, and measuring the effect on cell properties of cells grown in the culture medium containing the amniotic fluid from the test animal as compared with the use of amniotic fluid from an otherwise identical control animal that has not had the compound being screened administered to it.

4. A process as claimed in claim 1 wherein the profiles of accumulation and synthesis of individual proteins of the cells being cultured are measured, the synthesis being measured after incorporation of radioactive precursor before harvesting.

---

**4,129,644**

## PROTECTING SKIN AND HAIR WITH COSMETIC COMPOSITIONS CONTAINING SUPEROXIDE DISMUTASE

**Grégoire Kalopissis, Neuilly-sur-Seine; Bernard Jacquet, Antony, and Gérard Lang, Deuil-la-Barre, all of France, assignors to L'Oreal, Paris, France**

**Filed Oct. 10, 1975, Ser. No. 621,629**

**Claims priority, application Luxembourg, Oct. 15, 1974, 71110**

**Int. Cl.[2] A61K *7/06, 7/72, 7/48***

**U.S. Cl. 424—59** **8 Claims**

7. A process for protecting the skin from the harmful effects of ultra-violet rays comprising applying to the skin an effective amount of at least one superoxide dismutase to protect the skin from the harmful effects of ultra-violet rays.

---

**4,129,645**

## SUNSCREEN COMPOSITIONS

**Gabriel Barnett, New York; Nathan Gershaw, Commack, and Jack J. Mausner, East Hills, all of N.Y., assignors to Helena Rubinstein, Inc., New York, N.Y.**

**Continuation-in-part of Ser. No. 611,435, Sep. 5, 1975, Pat. No. 4,087,555. This application Apr. 19, 1977, Ser. No. 788,885**

**Int. Cl.[2] A61K *7/44***

**U.S. Cl. 424—60** **7 Claims**

1. An ultraviolet sunscreening composition for protection against the harmful rays of the sun comprising an oil phase, a water phase, and an encapsulated active base:

(A) said oil phase comprising an effective amount of an emulsifier, an effective amount of an emollient, and an effective amount of a non-ionic surfactant;

(B) said water phase comprising, in parts by weight, 0.10–7.50 parts of hectorite clay, 0.10–7.50 parts of a peptizer for said hectorite clay, 1.00–15.00 parts of a humectant, 0.10 parts of a hydrolyzed animal fatty protein complex, and water; and

(c) said encapsulated active base comprising, in parts by weight, 0.10–10.00 parts of hectorite clay; 0.10–3.0 parts of a polar group affording organic compound (1) characterized as being reactable with said hectorite clay to form water-insoluble particles having a size above colloidal dimensions when added to an aqueous colloidal solution of synthetic hectorite clay and tetrasodium pyrophosphate and (2) selected from the group consisting of a simple organic compound having at least one polar group characterized by insubstantial solubility in water at ordinary temperatures and (3) organic hydrophilic colloid; 0.05–2.00 parts of a peptizer for said clay; an effective amount of a sunscreen agent; and water.

---

**4,129,646**

## ISOLATING HEPATITIS B DANE PARTICLES

**William J. McAleer, Ambler, and Edward H. Wasmuth, Telford, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.**

**Continuation-in-part of Ser. No. 737,862, Nov. 2, 1976, abandoned. This application Apr. 4, 1977, Ser. No. 784,191**

**Int. Cl.[2] A61K *39/12;* C12K *7/00***

**U.S. Cl. 424—89** **10 Claims**

1. In a process for concentrating Dane particles from human biological fluid containing $HB_sAg$, the improvement comprising subjecting the fluid to isopycnic banding in sodium bromide density gradient encompassing the density range of from about 1.0 to about 1.41 g/cc and recovering fractions rich in Dane particles within the density range of from about 1.23 to about 1.30 g/cc.

---

**4,129,647**

## TREATMENT OF ACNE

**Edmund Klein, 1325 N. Forest Rd., Williamsville, N.Y. 14221**

**Filed Oct. 17, 1977, Ser. No. 843,053**

**Int. Cl.[2] A61K *39/02, 31/505***

**U.S. Cl. 424—92** **9 Claims**

1. A method for the therapeutic control and treatment of acne which comprises administering to a patient an immunogen selected from the group consisting of dinitrochlorobenzene and Bacillus Calmette-Guerin Vaccine which induces or potentiates an immune response on local administration in an amount sufficient to induce a delayed hypersensitivity reaction and thereafter applying to the skin of said patient an immunological preparation in an immunologically effective amount for the treatment of acne, said preparation comprising an immunogen selected from the group consisting of dinitrochlorobenzene and Bacillus Calmette-Guerin Vaccine together with a pharmaceutically acceptable carrier.

---

**4,129,648**

## METHOD FOR REDUCING ENDOGENOUS PROSTAGLANDIN SYNTHESIS

**Harry O. J. Collier, 23 Campden Hill Rd., London, W.8.; Sheikh A. Saeed, 14 Eastcote Ave., South Harrow, Middlesex; Cyril Schneider, 71 Redway Dr., Whitton, Twickenham, all of England, and Frank Mannuzza, 855 Oakside La., Park Forest South, Ill. 60466**

**Filed Nov. 21, 1977, Ser. No. 853,305**

**Int. Cl.[2] A61K *35/14, 35/16***

**U.S. Cl. 424—101** **22 Claims**

1. A therapeutic method of reducing or inhibiting endogenous prostaglandin synthesis in an individual for whom such

therapy is indicated, comprising administering to the individual an amount of a high molecular weight mammalian blood plasma or serum extract effective to reduce or inhibit the activity of prostaglandin synthetase, selected from the group consisting of Cohn fraction IV, Cohn subfraction $IV_1$, Cohn subfraction $IV_4$ and haptoglobin.

---

4,129,649

## PROCESS FOR PRODUCING EASILY ABSORBABLE AMORPHOUS STERYL GLUCOSIDE MONOPALMITATES AND PREPARATIONS THEREOF

Sho Inoue; Masanobu Kawamata; Hirokazu Ushimaru; Koichi Nakamichi, and Yutaka Takahashi, all of Kyoto, Japan, assignors to Nippon Shinyaku Co. Ltd., Japan

Filed May 5, 1976, Ser. No. 683,478

Claims priority, application Japan, May 24, 1975, 50-62263

Int. Cl.[2] A61K *31/705;* C07G *3/00*

U.S. Cl. 424—182 7 Claims

1. A process for the production of pharmaceutical composition having hemostatic activity which comprises converting a crystalline steryl glucoside monopalmitate to amorphous form by heating it to a temperature above 110° C. and in the range of 125°–145° C. and for a period of time of about 2–30 minutes to effect such conversion or by dissolving the crystalline steryl glucoside monopalmitate in an organic solvent in which it is soluble and distilling off the solvent, and admixing the thus formed amorphous steryl glucoside monopalmitate with physiologically harmless organic or inorganic fine particles to form a homogeneous dispersion having enhanced absorbability upon ingestion or administration and in which the amorphous steryl glucoside monopalmitate is absorbed on or dispersed in the physiologically harmless organic or inorganic fine particles in the proportion of at least 0.5 parts per part of steryl glucoside monopalmitate, by weight.

---

4,129,650

## NOVEL PHOSPHOLIPID DERIVATIVES OF PROSTAGLANDINS AND PROCESS OF THEIR PREPARATION

Hans Betzing, Horrem, and Dac Lekim, Cologne, both of Germany, assignors to A. Nattermann & Cie. GmbH, Cologne, Germany

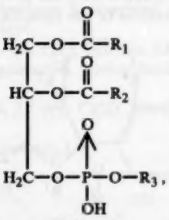
Filed Jun. 28, 1977, Ser. No. 810,820

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1976, 2629135

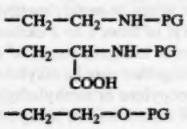
Int. Cl.[2] A61K *31/66, 31/685;* C07F *9/02*

U.S. Cl. 424—211 6 Claims

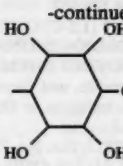
1. An ester or amide derivative of natural prostaglandin and having the formula



wherein $R_1$ and $R_2$ are each hydrogen or a fatty-acid radical with the proviso that at least one of $R_1$ or $R_2$ is a fatty-acid radical, and $R_3$ is one of the following groups



-continued



wherein PG is a prostagladin radical or its optical isomer, said PG being attached to the phospholipid through the carboxyl moiety.

6. A compound in accordance with claim 1 wherein $R_1$ and $R_2$ are both fatty acids.

---

4,129,651

## METHOD OF REMOVING NITROGEN OXIDES IN EXHAUST COMBUSTION GASES

Sakae Koike; Shoichi Matsunami, and Yasuo Fujiwara, all of Kurashiki, Japan, assignors to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 648,730, Jan. 13, 1976, abandoned. This application Nov. 8, 1976, Ser. No. 739,729

Claims priority, application Japan, Jan. 13, 1975, 50-6174; Jan. 16, 1975, 50-7312

Int. Cl.[2] C01B *21/00*

U.S. Cl. 423—235 2 Claims

1. In a method of removing nitrogen oxides noncatalytically from an exhaust combustion gas by maintaining said combustion gas at a temperature of from 700°–1300° C. in the presence of 0.1–15 Vol.% of oxygen in said combustion gas and an ammonia source in a combustion apparatus which has metallic heat exchange pipes in a zone downstream of the position where the ammonia source is added, the improvement which comprises:

feeding said ammonia source in an amount of 0.6–50 times the $NO_x$ concentration in said combustion gas into said exhaust combustion gas at a position where the total surface area of the heat exchange pipes, in the space downstream of the position of ammonia source addition which has a combustion gas residence time of about 1 second, is the range of $0.1 \times 10^{-5}$–$0.5 \times 10^{-2}$ $m^2$ per 1 $Nm^3/H$ of said combustion gas flow; and the temperature of said combustion gas at the outlet of said space is above 700° C.

---

4,129,652

## METHOD FOR POTENTIATING NEUROLEPTIC DRUGS

Kjell Fuxe, Sollentuna, Sweden, assignor to Nelson Research & Development Company, Irvine, Calif.

Continuation of Ser. No. 714,696, Aug. 16, 1976, abandoned, which is a division of Ser. No. 596,571, Jul. 16, 1975, Pat. No. 3,978,216, which is a continuation-in-part of Ser. No. 475,856, Apr. 23, 1974, Pat. No. 3,947,579. This application Jul. 25, 1977, Ser. No. 818,533

Int. Cl.[2] A61K *31/40, 31/54*

U.S. Cl. 424—247 1 Claim

1. A method for potentiating the neuroleptic activity of a phenothiazine derivative having neuroleptic activity comprising administering to a schizophrenic about 10 to about 50 percent of a conventional dosage amount of a phenothiazine derivative selected from the group consisting of chlorpromazine and thioridazine and an amount equal to about 0.1 to about 50 mg/kg of a gabergic compound selected from the group consisting of 5-ethyl-5-phenyl-2-pyrrolidone, 1-hydroxy-3-amino-2-pyrrolidone and a pharmaceutically acceptable salt thereof.

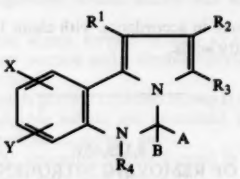
4,129,653

## SUBSTITUTED PYRROLO [1,2-C] QUINAZOLINES AND PHARMACEUTICAL COMPOSITIONS AND METHODS EMPLOYING THEM

Victor T. Bandurco, Somerville, and Seymour Levine, North Brunswick, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Jan. 5, 1977, Ser. No. 757,117
Int. Cl.[2] A61K *31/505;* C07D *487/14*
U.S. Cl. 424—251 29 Claims

1. A substituted pyrrolo(1,2-c)quinazoline of the formula:



and pharmaceutically-acceptable acid addition salts thereof, wherein:

$R_1$ and $R_2$ are each members selected from the group consisting of hydrogen, loweralkyl, naphthyl, phenyl, halophenyl, loweralkyphenyl, loweralkoxyphenyl, amino, COOH, COO loweralkyl;

$R_3$ is a member selected from the group consisting of hydrogen, loweralkyl, loweralkenyl, and halooweralkenyl;

$R_4$ is a member selected from the group consisting of hydrogen, hydroxymethyl, loweralkyl, cyanoethyl, CHO, COOH, COO loweralkyl, $(CH_2)_2COOH$, $(CH_2)_2COO$ loweralkyl,

X and Y are each members selected from the group consisting of hydrogen, halo, loweralkoxy, cyano;

a considered separately is hydrogen;

B considered separately is a member selected from the group consisting of hydrogen, halo; and

A and B considered together is a member selected from the group consisting of oxygen and sulfur.

22. A pharmaceutical composition useful in the treatment of cardiovascular disorders in dosage unit form comprising per dosage unit from about 5 to about 500 mg. of a compound of claim 1 in admixture with a pharmaceutical carrier suitable for internal administration.

23. The method of treating a patient having hypertension which comprises systemically administering to said patient an effective anti-hypertensive amount of a compound of claim 1.

---

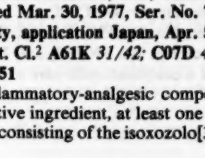
4,129,654

## ISOXAZOLO[3,4-d]PYRIMIDINES USEFUL AS ANTIINFLAMMATORY-ANALGESIC AGENTS

Ryuji M. Marumoto; Yoshiyasu Furukawa, Toyonaka, and Kiyohisa Kawai, Nagaokakyo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Mar. 30, 1977, Ser. No. 782,762
Claims priority, application Japan, Apr. 5, 1976, 51-38419
Int. Cl.[2] A61K *31/42;* C07D *498/04*
U.S. Cl. 424—251 26 Claims

1. An antiinflammatory-analgesic composition which comprises (A) as active ingredient, at least one compound selected from the group consisting of the isoxozolo[3,4-d]pyrimidines of the formula



(I)

wherein $R^1$, $R^2$ and $R^3$, respectively, are hydrogen, lower alkyl, cycloalkyl having 5 to 7 carbon atoms, or aryl selected from the group consisting of phenyl and naphthyl which may be substituted by halogen, and (B) a pharmaceutically acceptable carrier therefor.

---

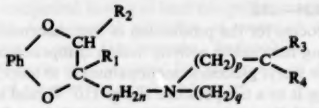
4,129,655

## NEUROLEPTIC 2-PIPERIDINOALKYL-1,4-BENZODIOXANS

Charles F. Huebner, Chatham, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 680,318, Apr. 26, 1976, which is a continuation-in-part of Ser. No. 589,118, Jun. 23, 1975, Pat. No. 4,039,676. This application Jan. 19, 1977, Ser. No. 760,493
Int. Cl.[2] C07D *409/14;* A61K *31/445*
U.S. Cl. 424—267 8 Claims

1. A compound corresponding to the formula



wherein Ph is unsubstituted 1,2-phenylene or 1,2-phenylene substituted by one or two members selected from lower alkyl, hydroxy, mercapto, lower alkoxy, lower alkylenedioxy, benzyloxy, lower alkylthio, halogeno, trifluoromethyl, nitro, or amino; n is an integer from 1 to 4; each of p and q is an integer from 1 to 3, but (p + q) = 4; each of $R_1$ and $R_2$ is hydrogen or lower alkyl; $R_3$ is hydrogen, hydroxy, lower alkoxy, lower 2- or 3-alkenyloxy, lower 2- or 3-alkynyloxy, lower or higher alkanoyloxy and $R_4$ is unsubstituted furyl, thienyl, benzofuryl or benzothienyl, or said heterocyclics mono- or disubstituted by lower alkyl, or therapeutically acceptable acid addition salts thereof.

---

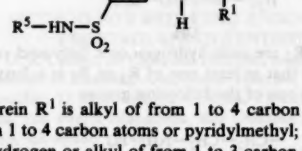
4,129,656

## THIAZOLIDINE DERIVATIVES, SALIDIURETIC COMPOSITIONS AND METHODS OF EFFECTING SALIDIURESIS EMPLOYING THEM

Hans-Jochen Lang, Altenhain, Taunus, and Roman Muschaweck, Frankfort am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 18, 1977, Ser. No. 760,411
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1976, 2601791
Int. Cl.[2] C07D *277/04, 277/60;* A61K *31/425, 31/435*
U.S. Cl. 424—263 14 Claims

1. A compound selected from the group consisting of thiazolidine derivatives of the formula



wherein $R^1$ is alkyl of from 1 to 4 carbon atoms, alkenyl of from 1 to 4 carbon atoms or pyridylmethyl; each of $R^2$ and $R^3$ is hydrogen or alkyl of from 1 to 3 carbon atoms, each of $R^4$ and $R^6$ is hydrogen or halogen, one of $R^4$ and $R^6$ being hydrogen, or $R^3$ and $R^4$ together may be alkylidene of up to 5 carbon atoms, ethylene, propylene or methylethylene; $R^5$ is hydrogen, alkyl of from 1 to 4 carbon atoms, benzyl, or benzyl substituted

in the aromatic nucleus by chlorine or methyl; Y is halogen; and Z is oxygen or sulfur;

and pharmaceutically acceptable acid addition salts thereof.

11. A method of effecting salidiuresis which comprises administering to a patient in need of salidiuretic treatment an amount of a compound as defined in claim 1 sufficient to effect salidiuresis.

12. A salidiuretic composition, in the form of a tablet, dragee, capsule, suppository or ampule, which comprises a compound as defined in claim 1, in an amount sufficient to effect salidiuresis, and a pharmaceutically usual filler or carrier substance.

---

4,129,657

## IMIDAZOLE GUANIDINES AND USE AS INHIBITORS OF HISTAMINE ACTIVITY

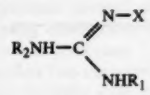
**Graham J. Durant, Welwyn Garden City; John C. Emmett, Codicote, and Charon R. Ganellin, Welwyn Garden City, all of England, assignors to Smith, Kline & French Laboratories Limited, Welwyn Garden City, England**

**Division of Ser. No. 726,356, Sep. 24, 1976, Pat. No. 4,083,988, which is a division of Ser. No. 560,909, Mar. 21, 1975, Pat. No. 4,000,296, which is a division of Ser. No. 384,992, Aug. 2, 1973, abandoned. This application Jan. 16, 1978, Ser. No. 869,418**

**Int. Cl.[2] A61K** *31/415;* **C07D** *233/64*

**U.S. Cl. 424—273 R** **6 Claims**

1. A compound of the formula:



wherein $R_1$ is hydrogen or lower alkyl; $R_2$ is a grouping of the formula

$$\text{Het} - (CH_2)_m Z (CH_2)_n -$$

wherein Het is imidazole which is attached at a ring carbon and which is optionally substituted by lower alkyl, trifluoromethyl or halogen; Z is sulphur, oxygen, NH or a methylene group; m is 0, 1 or 2 and n is 2 or 3, the sum of m and n being from 2 to 4; X is N=CHR$_5$; and $R_5$ is phenyl or a pharmaceutically acceptable acid addition salt thereof.

6. A method of inhibiting H-2histamine receptors which comprises administering to an animal in need of inhibition of said receptors in an effective amount to inhibit said receptors a compound of claim 1.

---

4,129,658

## 4-STYRYL-HEXAHYDRO-4-INDOLINOLS

**Richard Berthold, Bottmingen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland**

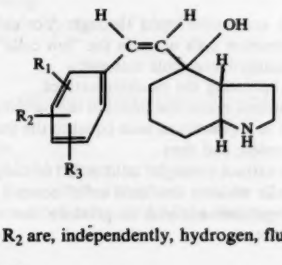
**Filed Sep. 19, 1977, Ser. No. 834,103**

**Claims priority, application Switzerland, Sep. 22, 1976, 12001/76**

**Int. Cl.[2] A61K** *31/415;* **C07D** *209/04, 405/06*

**U.S. Cl. 424—274** **36 Claims**

1. A compound of formula I,



I

wherein

$R_1$ and $R_2$ are, independently, hydrogen, fluorine, chlorine, trifluoromethyl, alkyl of 1 to 4 carbon atoms, or alkoxy of 1 to 4 carbon atoms, and

$R_3$ is hydrogen, or alkoxy of 1 to 4 carbon atoms, with the proviso that when $R_3$ is alkoxy then at least one of $R_1$ and $R_2$ is alkoxy, or

$R_1$ and $R_2$ are bound to adjacent ring carbon atoms and are together $-(CH_2)_m-$, wherein $m$ is 3 or 4, —CH=CH—CH=CH—, or —O—$CH_2$—X—, wherein X is —O— or —$CH_2$—, and

$R_3$ is hydrogen, fluorine, chlorine, trifluoromethyl, alkyl of 1 to 4 carbon atoms, or alkoxy of 1 to 4 carbon atoms,

or a pharmaceutically acceptable acid addition salt thereof.

27. A pharmaceutical composition useful in treating lipidemia which comprises a compound of claim 1 or a pharmaceutically acceptable acid addition salt thereof in an amount effective in obtaining a hypolipidemic effect, in association with a pharmaceutical carrier or diluent.

32. A method of obtaining a hypolipidemic effect in a mammal in need of such treatment which comprises administering to said mammal a hypolipidemic-effective amount of a compound of claim 1 or a pharmaceutically acceptable acid addition salt thereof.

35. A method of obtaining an anti-arrhythmic effect in a mammal in need of such treatment which comprises administering to said mammal an anti-arrhythmic-effective amount of a compound of claim 1 or a pharmaceutically acceptable acid addition salt thereof.

---

4,129,659

## METHOD FOR IMPROVING CARDIOVASCULAR FUNCTION WITH SALINOMYCIN

**Berton C. Pressman, Coral Gables, and Norberto T. deGuzman, Miami Beach, both of Fla., assignors to The University of Miami, Miami, Fla.**

**Filed Aug. 8, 1977, Ser. No. 823,045**

**Int. Cl.[2] A61K** *31/35*

**U.S. Cl. 424—283** **12 Claims**

1. The method of increasing the contractility of mammalian heart muscle in a warm blooded mammal which comprises administering an effective non-toxic dose of salinomycin or the pharmaceutically acceptable sodium or potassium salt thereof.

---

4,129,660

## DERIVATIVES OF CIS-EPOXY-1,2-PROPYL-PHOSPHONIC ACID AND DRUGS CONTAINING IN PARTICULAR AS ACTIVE INGREDIENTS DERIVATIVES OF CIS-EPOXY-1,2-PROPYLPHOSPHONIC ACID IN DEXTROROTATORY FORM

**Christian J. Warolin, Paris; Pierre Chabrier de Lassauniere, La Chesnaye, and Nguyen T. Thuong, La Celleric, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Paris, France**

**Division of Ser. No. 704,629, Jul. 12, 1976. This application May 31, 1977, Ser. No. 801,921**

**Claims priority, application United Kingdom, Jul. 16, 1975, 29918; Jul. 16, 1975, 29919**

**Int. Cl.[2] A61K** *31/665*

**U.S. Cl. 424—203** **4 Claims**

1. A method for treating bilharziasis comprising administering to a patient in need of said treatment an effective amount for treating bilharziasis of dextrorotatory cis-epoxy-1,2 propylphosphonic acid or a pharmaceutically acceptable salt thereof.

## 4,129,661
## 4,5-DIHYDRO-2-LOWER ALKOXYCARBONYLAMINO-4-PHENYLIMIDAZOLES AND SUBSTITUTED PHENYL DERIVATIVES THEREOF

**Adolph P. Roszkowski, Saratoga; Colin C. Beard; Charles Dvorak, both of Palo Alto, and Klaus Weinhardt, Redwood City, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.**

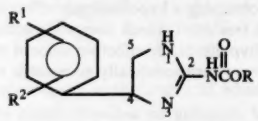
**Continuation-in-part of Ser. No. 682,682, May 3, 1976, abandoned, which is a continuation-in-part of Ser. No. 599,551, Jul. 28, 1975, abandoned. This application Oct. 17, 1977, Ser. No. 842,655**

**The portion of the term of this patent subsequent to May 9, 1995, has been disclaimed.**

**Int. Cl.[2] A61K *31/415*; C07D *233/48***

**U.S. Cl. 424—273 R** **77 Claims**

1. A compound having the formula



(I)

wherein R is lower alkyl; $R^1$ is hydrogen, lower alkyl, hydroxy, lower alkoxy, fluoro, chloro, bromo, iodo or trifluoromethyl and $R^2$ is hydrogen or is a substituent which is identical to the $R^1$ substituent and wherein $R^1$ and $R^2$ can each be at any different position on the phenyl ring or $R^1$ and $R^2$ together form methylenedioxy and are at adjacent carbon atoms on the phenyl ring; and pharmaceutically acceptable salts thereof.

75. A method for treating, palliating or preventing abnormal conditions related to the central nervous system, in a mammal, such as depressive illness, epileptic or convulsant seizure states, anxiety, and disorders involving muscle spasms or spasticity which method comprises administering an effective amount of the compound of claim 1 to said mammal.

---

## 4,129,662
## RETINOIC ACID DERIVATIVES FOR THE TREATMENT OF ACNE

**Robert J. Gander, Whitehouse, and John A. Gurney, East Brunswick, both of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.**

**Division of Ser. No. 628,185, Nov. 3, 1975, Pat. No. 4,055,659. This application Aug. 5, 1977, Ser. No. 822,281**

**Int. Cl.[2] A61K *31/215*; C11C *3/00***

**U.S. Cl. 424—305** **9 Claims**

1. 4-Nitrobenzyl all-trans-retinoate.

6. A method for treatment of acne in a subject requiring such treatment which comprises topical application to the acne site of said subject of a composition comprising an effective acne-treatment amount of 4-nitrobenzyl all-trans-retinoate admixed with a pharmaceutically-acceptable topical vehicle.

---

## 4,129,663
## POURABLE SALAD DRESSING COMPOSITION

**Joel D. Jamison, Wilmington, Del.; Gordon A. Towle, Landenberg, Pa., and J. Gregory Vermeychuk, Wilmington, Del., assignors to Hercules Incorporated, Wilmington, Del.**

**Filed Nov. 18, 1977, Ser. No. 852,654**

**Int. Cl.[2] A23L *1/24***

**U.S. Cl. 426—602** **8 Claims**

1. In a low pH, liquid, pourable salad dressing composition consisting essentially of an oil-in-water emulsion, a stabilizer therefor, and appropriate seasonings to impart to said dressing a distinctive flavor characteristic, the improvement which comprises adding as said stabilizer about 0.3% to 0.8% Xanthan gum and 0.2 to 2% pectin, based on the total weight of said salad dressing and thereby imparting freeze-thaw stability thereto.

## 4,129,664
## PROCESS FOR THE PRODUCTION OF A VEGETABLE-BASED SWEETENED CONDENSED MILK

**Jan Kruseman, Tatroz; Pierre Y. Bertschy, Chardonne, and Jaime Hidalgo, La Tour-de-Peilz, all of Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., La Tour de Peilz, Switzerland**

**Continuation of Ser. No. 738,877, Nov. 4, 1976, abandoned. This application Feb. 9, 1978, Ser. No. 876,512**

**Claims priority, application Switzerland, Nov. 14, 1975, 14787/75**

**Int. Cl.[2] A23C *11/00*; A23L *1/20***

**U.S. Cl. 426—7** **8 Claims**

1. A process for the production of a vegetable-based sweetened condensed milk, which comprises subjecting a vegetable protein in the form of an aqueous solution or suspension to proteolytic enzymatic hydrolysis for a period of from about 4 to 24 hours at a temperature in the range of about 25° to 65° C. at a pH of about 2 to 9, the amount of proteolytic enzyme added to the solution or suspension being in the range of about 0.176 to 2% in weight of the dry matter of the solution or suspension, and preparing a mixture containing approximately 4 to 9 parts by weight of fats, 8 to 18 parts by weight of said enzymatically hydrolyzed protein, 0 to 14 parts by weight of lactose, 40 to 55 parts by weight of sucrose and 25 to 32 parts by weight of water.

---

## 4,129,665
## PROCESS FOR THE EXTRACTION OF VEGETABLE MATERIALS

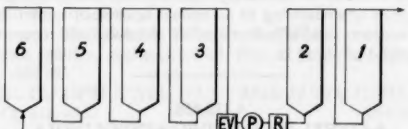
**Brian Clark, Yverdon, Switzerland, assignor to Societe d'Assistance Technique pour Produits Nestle S.A., LaTour de Peilz, Switzerland**

**Filed Apr. 1, 1977, Ser. No. 783,564**

**Claims priority, application Switzerland, Apr. 9, 1976, 4519/76**

**Int. Cl.[2] A23D *1/08***

**U.S. Cl. 426—432** **6 Claims**




1. A process for extracting vegetable materials to form a vegetable extract by contacting progressively fresher vegetable materials countercurrently with an extraction liquid which comprises:

(a) passing the extraction liquid through "hot cells" of a group of extraction cells wherein the "hot cells" contain the most exhausted vegetable material;

(b) partially evaporating the resulting extract;

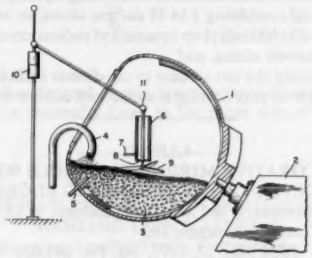
(c) adding additional extraction liquid to the partially evaporated extract in a quantity at least equal to the quantity of liquid evaporated; and then

(d) passing the extract through "cold cells" of the group of extraction cells wherein the "cold cells" contain the least exhausted vegetable material to produce the vegetable extract product.

## 4,129,666
## METHOD OF PROVIDING PELLETS WITH A WATER INSOLUBLE COATING USING A MELT

Walter Wizerkaniuk, 4146 Joshua Rd., Lafayette Hill, Pa. 19444

Filed Apr. 29, 1977, Ser. No. 792,461
Int. Cl.[2] B44C *1/08;* A61K *16/28*
U.S. Cl. 427—3 4 Claims



1. A process for enterically coating medicinal pellets in a rotating coating pan equipped with a rotatable propeller having a substantially vertically disposed shaft, means for controlling the temperature of the pellets when disposed in the coating pan and a coating composition container equipped with heating element, temperature control and closeable conduit to release molten coating composition from the container onto the shaft which process comprises;

(a) placing the pellets into the rotating pan and adjusting the position of the propeller such that each propeller blade during its revolution will continually contact only the upper level of the pellets,

(b) maintaining the pellets at a temperature of about 2°–3° C. below the melting temperature of the coating composition,

(c) dispersing the coating composition onto the pellets in a uniform manner by releasing molten coating composition from the container through the closeable conduit to flow down the propeller shaft onto and over the rotating propeller blades and onto the pellets,

(d) rotating the pan to obtain a uniform coating on each pellet.

---

## 4,129,667
## RADIATION CURABLE COATING COMPOSITION COMPRISING AN ACRYL URETHANE OLIGOMER AND AN ULTRA-VIOLET ABSORBER

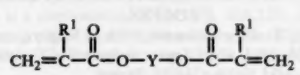
Donald H. Lorenz, Basking Ridge; Shu-Tung Tu, E. Brunswick, and Donald P. Wyman, Wayne, all of N.J., assignors to GAF Corporation, New York, N.Y.

Filed Dec. 29, 1977, Ser. No. 865,663
Int. Cl.[2] B05C *5/00, 17/04*
U.S. Cl. 427—44 4 Claims

1. A process for coating a substrate comprising in sequence the steps of:

I. contacting the substrate with a coating composition comprising:

A. an oligomer of Formula I:



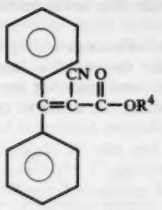
(I)

wherein:

$R^1$ is hydrogen or methyl;

Y is a divalent urethane residue;

B. an acrylic ultra-violet light absorber of the Formula IV:



(IV)

wherein $R^4$ is alkyl or hydroxy alkylene;

C. a photoinitiator to form a coated substrate wherein the amount of B. is 0.5 to 3 weight percent based on the weight of the composition,

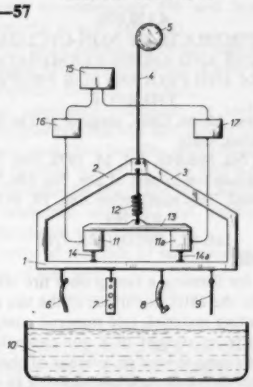
II. exposing the coated substrate to actinic radiation until an adherent dry polymerized weather-resistant coating is formed on the substrate.

---

## 4,129,668
## METHOD OF DRAINING PARTS EMERGING FROM HOT GALVANIZING BATHS

Georges Rouquié, Fontenay Le Fleury, France, assignor to Bertin & Cie, Plaisir, France

Filed Apr. 8, 1977, Ser. No. 785,790
Claims priority, application France, Apr. 12, 1976, 76 10648
Int. Cl.[2] C23C *1/02*
U.S. Cl. 427—57 3 Claims



1. A method of draining a plurality of parts emerging from a hot galvanizing bath while hanging from a support comprising setting said plurality of parts hanging from said support in vibration wherein the vibration is obtained by exciting within a frequency range of narrow-band white noise the said frequency range covering the natural fundamental frequencies of the said parts.

---

## 4,129,669
## METHOD OF APPLYING DECORATIVE DESIGNS TO SURFACES

Martha Z. Lopez, 224 Holly Ave., South San Francisco, Calif. 94080

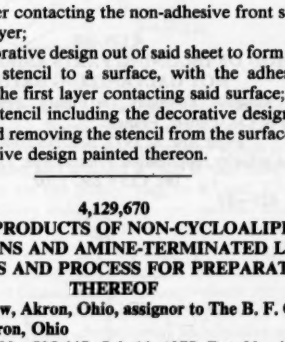
Filed Nov. 1, 1976, Ser. No. 737,482
Int. Cl.[2] B05D *1/32;* B41N *1/24*
U.S. Cl. 427—282 1 Claim

1. A method of applying decorative designs through a stencil to surfaces, comprising:

placing a first layer of smooth waterproof adhesive tapes having a width less than the desired stencil width adjacent each other longitudinally to obtain a desired stencil width, each of said tapes having a non-adhesive waterproof front

surface and an adhesive rear surface, said adhesive being thicker at the outside than in the middle of the rear surface;

placing a second layer of smooth waterproof adhesive tapes adjacent each other on said first layer in overlapping relationship thereto and covering the seams therein to form a laminated sheet, the adhesive rear surface of said




second layer contacting the non-adhesive front surface of said first layer;

cutting a decorative design out of said sheet to form a stencil;

applying the stencil to a surface, with the adhesive rear surface of the first layer contacting said surface;

painting the stencil including the decorative design cut out portion; and removing the stencil from the surface leaving the decorative design painted thereon.

---

**4,129,670**

## REACTION PRODUCTS OF NON-CYCLOALIPHATIC EPOXY RESINS AND AMINE-TERMINATED LIQUID POLYMERS AND PROCESS FOR PREPARATION THEREOF

**Changkiu K. Riew, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio**

**Division of Ser. No. 595,445, Jul. 14, 1975, Pat. No. 4,055,541, which is a continuation-in-part of Ser. No. 586,723, Jun. 13, 1975, abandoned. This application Aug. 15, 1977, Ser. No. 824,761**

**Int. Cl.[2] B05D *1/28, 7/02***

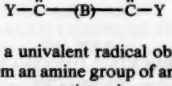
**U.S. Cl. 427—386** **12 Claims**

1. A process for forming a facing on a tire comprising

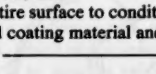
(1) applying to the exterior surface of the tire a thin layer of a liquid coating material, said material comprising:

(A) 100 parts by weight of a non-cycloaliphatic epoxy resin containing at least an average of about 1.7 oxirane groups per molecule, said resin having an epoxy equivalent weight from about 70 to about 6000, and

(B) from about 1 to about 1,000 parts by weight of an amine-terminated liquid polymer containing an average from about 1.7 to about 3 amine groups per molecule, said groups being primary, secondary or a mixture thereof, and said polymer having the formula




wherein Y is a univalent radical obtained by removing hydrogen from an amine group of an aliphatic, alicyclic, heterocyclic or aromatic amine containing from 2 to 20 carbon atoms and at least two amine groups, at least two of said amine groups being primary, secondary or a mixture thereof, and B is a polymeric backbone consisting of carbon-carbon linkages and containing polymerized units of at least one vinylidene monomer having at least one terminal $CH_2=C<$ group, said monomer being selected from the group consisting of (a) monoolefins containing 2 to 14 carbon atoms, (b) dienes containing 4 to 10 carbon atoms, (c) vinyl and allyl esters of carboxylic acids containing 2 to 8 carbon atoms, (d) vinyl and allyl ethers of alkyl radicals containing 1 to 8 carbon atoms, and (e) acrylic acids and acrylates having the formula




said R being hydrogen or an alkyl radical containing 1 to 3 carbon atoms and said $R^1$ being hydrogen, an alkyl radical containing 1 to 18 carbon atoms, or an alkoxyalkyl, alkylthioalkyl or cyanoalkyl radical containing 2 to 12 carbon atoms, and

(2) subjecting the tire surface to conditions sufficient to cure the layer of said coating material and adhere it to the tire.

---

**4,129,671**

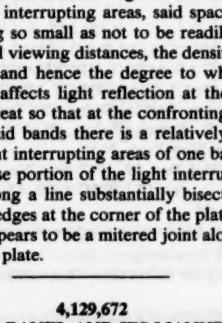
## DECORATIVE MIRRORED ARTICLE WITH BEVEL-EFFECT PRODUCING EDGES

**Ronald C. Greenberg, Bel Air, Calif., assignor to t.h.e. Original Mirror Company, Chicago, Ill.**

**Filed May 27, 1977, Ser. No. 801,039**

**Int. Cl.[2] B32B *3/02***

**U.S. Cl. 428—48** **11 Claims**




1. In a decorative rectangular mirrored article comprising a generally transparent plate of substantially the same thickness throughout including the marginal portions thereof, and have a plurality of straight edges intersecting at various corners of the plate, there being a mirror-forming surface at the rear of the plate, the improvement comprising means forming within a band along each margin of the plate and visible from the front of the plate what appears to be a bevelled edge therealong, said means along said band along each margin of the plate comprising spaced, light interrupting areas behind which said mirror-forming surface extends to reflect light to the front of the plate between said light interrupting areas, said spaced light interrupting areas being so small as not to be readily individually descernible at usual viewing distances, the density of said light interrupting areas and hence the degree to which said light interrupting areas affects light reflection at the ends of said bands varying thereat so that at the confronting ends of each adjacent pair of said bands there is a relatively high density portion of said light interrupting areas of one band opposite a relatively low dense portion of the light interrupting areas of the other band along a line substantially bisecting the angle between the plate edges at the corner of the plate involved, so as to form what appears to be a mitered joint along said line at each corner of the plate.

---

**4,129,672**

## AUTO CEILING PANEL AND ITS MANUFACTURING PROCESS

**Takao Momura; Yoshiro Umemoto, both of Nagoya, and Tatsuo Sakamoto, Okazaki, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan**

**Filed Apr. 11, 1978, Ser. No. 895,388**

**Claims priority, application Japan, May 12, 1977, 52-54664**

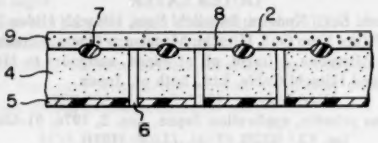
**Int. Cl.[2] B62D *25/06;* B32B *3/10, 3/26***

**U.S. Cl. 428—138** **33 Claims**

1. Auto ceiling panel comprising:

a metal lath coated with plastics around the meshes;

a foamed plastic layer with numerous through holes which is thermally fused to one side of said metal lath;




and another foamed plastic layer with continuous bubbles which is thermally fused to the other side of said metal lath.

---

**4,129,673**

## SNOWPLOWING RESISTING ROAD SURFACE MARKING TAPE MATERIAL

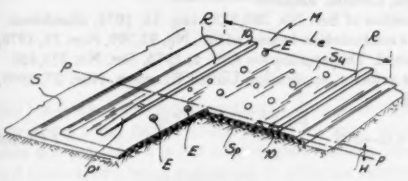
**Ludwig Eigenmann, Vacallo, Ticino, Switzerland**

**Filed Apr. 13, 1977, Ser. No. 787,072**

**Claims priority, application Italy, Apr. 15, 1976, 22352 A/76; Dec. 24, 1976, 30886 A/76**

**Int. Cl.² E01F *9/04***

**U.S. Cl. 428—172** **11 Claims**




1. A prefabricated pavement marking tape, comprising a unitary structure including an elongated tape portion securable to a pavement and having a substantially planar traffic-wear resistant upper surface; a plurality of retroreflective elements each having a lower section embedded in said tape portion and an upper section projecting above said upper surface of said tape portion to a predetermined height; and at least one uninterrupted rail portion extending lengthwise of the direction of elongation of said tape portion and being free of said retroreflective elements, said rail portion being provided on said upper surface of said tape portion and projecting upwardly therefrom to a height exceeding the predetermined height to which said upper sections of said retroreflective elements project, so as to protect said tape portion and said upper sections of said retroreflective elements against impingement of and damage by a snowplow.

---

**4,129,674**

## FIBROUS MAT ESPECIALLY SUITABLE FOR ROOFING PRODUCTS AND A METHOD OF MAKING THE MAT

**George J. Hannes, Maumee; Theodore R. Rohweder; Hans W. Dreikorn, both of Toledo, all of Ohio, and Philip B. Shepherd, Sedalia, Colo., assignors to Johns-Manville Corporation, Denver, Colo.**

**Continuation of Ser. No. 650,109, Jan. 19, 1976, abandoned, which is a continuation of Ser. No. 486,123, Jul. 5, 1974, abandoned, which is a division of Ser. No. 301,578, Oct. 27, 1972, abandoned. This application Aug. 9, 1976, Ser. No. 712,632**

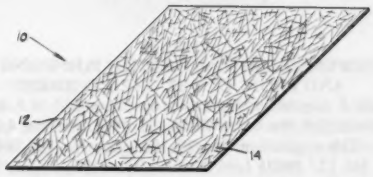
**Int. Cl.² B04D *1/00***

**U.S. Cl. 428—285** **6 Claims**

1. In a roofing product having as its base a fibrous glass mat coated on both sides with bituminous material, said mat being of the type (1) which is relatively thin, for example approximately 0.035 inch thick, (2) which includes both monofilament glass fibers and glass fiber bundles and a binder substance to cooperate in holding the monofilament fibers and fiber bundles together to form said mat, and (3) which is made by a process of preparing a dilute water slurry including said monofilament fibers and fiber bundles, vacuum filtering said slurry through a moving wire screen to from a web which together with said binder forms said mat, the improvement comprising the utilization of:

(a) a plurality of individual monofilament glass fibers between approximately 22 mm and 35 mm in length and between approximately 12 microns and 19 microns in diameter, said fibers comprising between approximately 70% and 95% of the total fibrous material in said web,

(b) a plurality of glass fiber bundles having ends, each of said bundles consisting essentially of a plurality of monofilaments held together in said bundle by a water insoluble




binder substance, said glass fiber bundles being between approximately 65 mm and 75 mm in length, and comprising between approximately 5% and 30% of the total fibrous material in said web; and

(c) a relatively small amount of binder substance to cooperate in holding said web of monofilament fibers and fiber bundles together to form said mat;

(d) said mat consisting essentially of said monofilament fibers, said fiber bundles and said binder and said monofilament fibers and fiber bundles cooperating with one another in a random fashion to from said web such that

(i) said monofilament fibers and fiber bundles are substantially randomly oriented and uniformly dispersed throughout said web and,

(ii) a majority of the ends of said bundles are within the confines of said web.

---

**4,129,675**

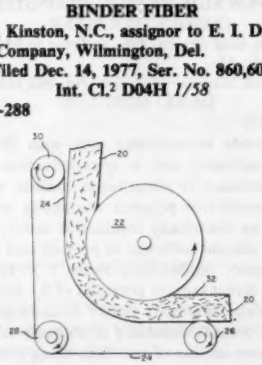
## PRODUCT COMPRISING BLEND OF HOLLOW POLYESTER FIBER AND CRIMPED POLYESTER BINDER FIBER

**Paul T. Scott, Kinston, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Dec. 14, 1977, Ser. No. 860,601**

**Int. Cl.² D04H *1/58***

**U.S. Cl. 428—288** **4 Claims**




1. A fiberfill blend for making into a batt for heat bonding of said batt to make the fiberfill especially suitable for garments, said blend consisting essentially of from 55 to 97% by weight of crimped hollow polyester fiber having a void content of from 8 to 30% by volume and, complementally to total 100%,

3 to 45% by weight of crimped binder fibers of a lower melting polyester than said hollow polyester fiber, said blend possessing properties for providing batts having, as compared to batts provided from a blend which is the same except that the same weight of solid polyester fiber has been substituted for the hollow polyester fiber in the blend: (a) higher filling power but at least as low bulk under load when heat bonded by convection or radiation heating, and (b) higher filling power and a surface formable into a higher cover, less porous bonded skin by contact heating of said surface accompanied by compressing said batt during said heating no more than 50% of the original thickness of said batt.

---

**4,129,676**

## PRIMER COMPOSITION, PROCESS FOR USING SAME AND PRODUCT OBTAINED THEREBY

**Richard J. Guglielmo, Sr., Lambs La., Cresskill, N.J. 07626**

**Division of Ser. No. 643,699, Dec. 23, 1975, Pat. No. 4,046,587. This application Apr. 28, 1977, Ser. No. 791,784**

**Int. Cl.[2] B05D** *1/36;* **B32D** *5/18;* **C09J** *5/02, 5/00*

**U.S. Cl. 428—315** **7 Claims**

1. A process for treating a polyolefinic-containing foam material to effect adhesion of polyvinyl film thereto which comprises:

forming a primer composition by admixing a chlorinated hydrocarbon and a resin material selected from the group consisting of a chlorinated paraffin wax, an acrylic type ester polymer and a vinyl copolymer, and mixtures thereof, said resin material constituting of from 2 to 10 percent by weight of said primer composition;

coating said polyolefinic-obtaining foam material with said primer composition; and

thereafter over-laying said primer coated polyolefinic-containing foam with said polyvinyl film.

---

**4,129,677**

## MELT SPUN SIDE-BY-SIDE BICONSTITUENT CONDUCTIVE FIBER

**Norman W. Boe, Gulf Breeze, Fla., assignor to Monsanto Company, St. Louis, Mo.**

**Filed May 31, 1977, Ser. No. 802,141**

**Int. Cl.[2] D02G** *3/00*

**U.S. Cl. 428—372** **7 Claims**

1. A side-by-side biconstituent melt spun fiber having a conductive constituent and a nonconductive constituent, wherein said conductive constituent consists essentially of normally nonconductive polymer containing uniformly dispersed therein an electrically conductive material in particulate form in an amount sufficient to provide said fiber with an electrical resistance of less than about $1 \times 10^{10}$ ohms per centimeter at a direct current potential of 0.1 volt when measured at 20% relative humidity and 21° C. and said nonconductive constituent consists essentially of normally nonconductive polymer, the cross-section of said fiber being characterized in that the conductive constituent extends along a portion (L) of the periphery of the fiber and inwardly therefrom a distance (D) whereby the ratio of L to D is in the range of 4:1 to 100:1, wherein the interface formed by said nonconductive constituent/conductive constituent is convex/concave and the cross-sectional area of said conductive constituent comprises less than about 20% of the cross-sectional area of said fiber.

**4,129,678**

## SELF-BONDABLE INSULATED WIRES COMPRISING THREE COATINGS INCLUDING A PHENOXY RESIN OUTER LAYER

**Masatoshi Seki, Kodaira; Moriichi Sato, Hitachi; Hideo Tsukioka, Mito; Etuo Ohe, Hitachi; Masatsugu Ogata, Hitachi, and Akio Mitsuoka, Hitachi, all of Japan, assignors to Hitachi, Ltd. and Hitachi Cable, Ltd., both of, Japan**

**Filed May 26, 1977, Ser. No. 800,788**

**Claims priority, application Japan, Jun. 2, 1976, 51-63624**

**Int. Cl.[2] B32B** *15/02, 15/08;* **H01B** *3/36*

**U.S. Cl. 428—383** **10 Claims**

1. A self-bondable insulated wire comprising a conductor and three resin insulating layers, wherein the first resin insulating layer, the layer adjacent said conductor, is formed with a resin selected from the group consisting of polyimide resins, polyamideimide resins and polyesterimide resins, the intermediate resin insulating layer is formed with a resin selected from the group consisting of polyvinyl formal resins and epoxy resins, and the outermost resin insulating layer is formed with a self-bondable resin of phenoxy series.

---

**4,129,679**

## MULTI-LIMBED REGENERATED CELLULOSE FILAMENTS

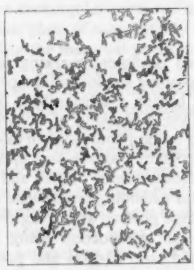
**Calvin R. Woodings, Nuneaton, England, assignor to Courtaulds Limited, London, England**

**Continuation of Ser. No. 280,113, Aug. 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 92,799, Nov. 25, 1970, abandoned. This application Oct. 2, 1974, Ser. No. 511,434**

**Claims priority, application United Kingdom, Nov. 27, 1969, 58002/69**

**Int. Cl.[2] D02G** *3/00*

**U.S. Cl. 428—398** **2 Claims**



1. A bundle of highly absorbent, regenerated cellulose filaments, substantially all of the filaments of said bundle having a collapsed hollow structure, and at least 60 percent of said filaments comprising in cross-section at least three elongated limbs extending from a common origin, the water imbibition of said bundle being from 170 to 345 percent.

---

**4,129,680**

## CHROME DENTAL ALLOY

**Raymond F. Vines, Chatham, N.J., assignor to Sterndent Corporation, Mount Vernon, N.Y.**

**Filed Feb. 6, 1974, Ser. No. 440,059**

**Int. Cl.[2] B32B** *7/06;* **E05D** *15/00, 15/26;* **A61C** *5/12*

**U.S. Cl. 428—433** **5 Claims**

1. A shaped hot-worked chromium-containing alloy piece of pre-determined size comprising at least about 20 percent by weight chromium and suitable for casting dental appliances and being essentially free of deleterious amounts of carbon, nitrogen and oxygen, said shaped hot-worked chromium-containing alloy piece of predetermined size being formed by:

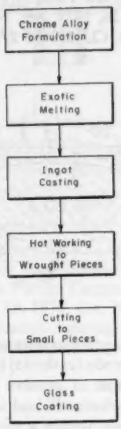
(a) fusing the chromium-containing alloy to form a melt in a

heating means which substantially excludes the presence of carbon, oxygen and nitrogen from said melt;

(b) pouring the melt obtained in step (a) into a mold to form an ingot;

(c) hot-working the ingot obtained in step (b) to obtain an intermediate shaped piece; and

(d) dividing the intermediate shaped piece obtained in step (c) into said shaped hot-worked chromium containing alloy pieces of pre-determined size,




said hot-worked chromium-containing alloy piece of predetermined size being further characterized by being coated with glass derived from a water-soluble glass-forming compound, said coating step being conducted to minimize contamination with carbon, oxygen or nitrogen or other tramp elements during melting in dental laboratories preparatory to casting the alloy into dental appliances.

---

**4,129,681**

## COATING COMPOSITIONS COMPRISING ALKOXYMETHYLAMINOTRIAZINES, POLYOLS AND POLYHYDROXY OLIGOMERS

**George J. Anderson, East Longmeadow; Timothy F. Desmond, Longmeadow, and J. Owen Santer, East Longmeadow, all of Mass., assignors to Monsanto Company, St. Louis, Mo.**

**Filed Oct. 20, 1976, Ser. No. 733,976**
**Int. Cl.[2] C08L** *61/28, 33/08*
**U.S. Cl. 428—524** **17 Claims**

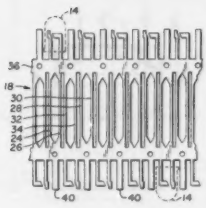
1. A coating composition comprising a blend of 1,4-dimethylolcyclohexane, a polyhydroxy oligomer of molecular weight in the range of about 200 to about 1000 selected from the group consisting of polyesters, polyacrylates and polymethacrylates, and a substantially completely methylolated polyaminotriazine substantially fully etherified with at least one $C_1$ to $C_4$ alcohol and from about 0.1 to about 10 weight percent of a soluble acid catalyst of pKa less than about 5, wherein the ratio of the hydroxyl groups of the 1,4-dimethylolcyclohexane to the hydroxyl groups of the oligomer is in the range of about 2:1 to about 1:4 and wherein the ratio of the hydroxyl groups of the 1,4-dimethylolcyclohexane and the oligomer to the alkoxymethyl groups of the polyaminotriazine is in the range of about 2:1 to about 1:2.

**4,129,682**

## HIGH DENSITY LED LEAD FRAME

**Walter P. Stewart, Palo Alto, and Lawrence F. Punte, San Jose, both of Calif., assignors to Monsanto Company, St. Louis, Mo.**

**Filed Nov. 16, 1977, Ser. No. 852,171**
**Int. Cl.[2] H01K** *1/40;* **H01L** *23/12, 31/02*
**U.S. Cl. 428—571** **13 Claims**




1. A high density separable lead frame for light-emitting diodes comprising

a unitary one piece elongated metal strip having a substantially uniform thickness, said strip including first and second segments separable into two unitary strips, each of said strips having a plurality of lead pairs.

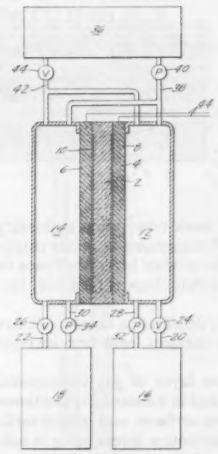
---

**4,129,683**

## ANHYDROUS $H_2/Cl_2$ REGENERATIVE FUEL CELL

**Donald L. Maricle, Glastonbury, Conn., assignor to United Technologies Corp., Hartford, Conn.**

**Filed Dec. 23, 1977, Ser. No. 863,817**
**Int. Cl.[2] H01M** *8/18*
**U.S. Cl. 429—21** **8 Claims**




1. A regenerative fuel cell including:

a matrix;

an electrode on each side of the matrix;

container means external to the cell for separately containing hydrogen and chlorine;

means connecting the container means to the cell for supplying the hydrogen and chlorine from the container means to the electrodes on the sides opposite the matrix;

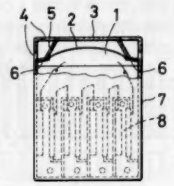
an anhydrous electrolyte in the matrix dissolves the reacting gas in the cell; and

a tank external to the cell to receive hydrogen chloride gas evolved within the cell during discharge of the cell.

## 4,129,684
## FLOAT TYPE METAL-AIR BATTERY

Yuichi Watakabe, Yokohama, Japan, assignor to Furukawa Denchi Kabushiki Kaisha, Yokohama, Japan

Filed Feb. 9, 1978, Ser. No. 876,451
Claims priority, application Japan, Feb. 15, 1977, 52-1707152
Int. Cl.[2] H01M *8/20*
U.S. Cl. 429—27 5 Claims



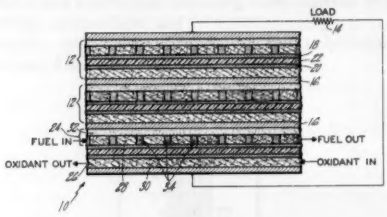

1. In a float type metal-air battery having an air pervious water repellent membrane defining a roof for an air chamber above the battery cells, the improvement comprising the combination of a lid enclosing said membrane, said lid having at least one opening, and an internal shelter plate interposed between said opening and said membrane, whereby at least a substantial portion of said membrane is protected from water incoming from outside through the opening.

---

## 4,129,685
## FUEL CELL STRUCTURE

Paul J. Damiano, Manchester, Conn., assignor to United Technologies Corp., Hartford, Conn.

Filed Aug. 15, 1977, Ser. No. 824,766
Int. Cl.[2] H01M *4/96, 4/86*
U.S. Cl. 429—38 14 Claims




1. In a cell stack comprising a plurality of electrochemical cells, each cell comprising an anode catalyst layer spaced apart from a cathode catalyst layer, the space therebetween adapted to have electrolyte disposed therein, the improvement comprising:

a pair of gas distribution layers each having first and second opposing surfaces, said first surfaces facing each other; and

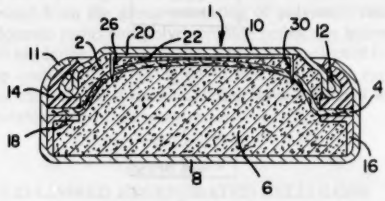
a continuous layer of gas impermeable material disposed between and in substantially continuous contact with both of said first surfaces, said second surface of one of said pair of gas distribution layers being in substantially continuous contact with the cathode catalyst layer of one of said fuel cells, and said second surface of said other gas distribution layer being in substantially continuous contact with the anode catalyst layer of the next adjacent cell, wherein said gas distribution layers are gas porous, the gas distribution layers being sufficiently thick and including enough pores sufficiently large to permit a substantially free flow of a reactant gas therethrough both perpendicular to and parallel to the planes of their surfaces, each of said gas distribution layers also including a thin fine pore layer defining said second surface and a thicker larger pore layer behind said fine pore layer, said fine pores sized to permit a catalyst layer to be applied thereto without a substantial amount of catalyst entering said pores, at least one of said pair of gas distribution layers including means defining an electrolyte reservoir region in communication with the electrolyte space between said catalyst layers.

---

## 4,129,686
## PRONGED ANODE COLLECTOR FOR INTERNALLY SHORTING GALVANIC CELLS

Mitchell J. Kaduboski, North Olmsted, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Nov. 16, 1977, Ser. No. 851,961
Int. Cl.[2] H01M *2/34*
U.S. Cl. 429—61 18 Claims




1. A galvanic cell having a consumable negative electrode (anode), a positive electrode (cathode) that expands during cell discharge or as the result of abusive discharge, a separator between said negative electrode and said positive electrode, and an electrolyte housed within a two-part conductive container, the first part of the conductive container being electronically connected to the negative electrode, the second part of the container being electronically connected to the positive electrode and wherein said first part and said second part of the container are electronically insulated from each other; the improvement wherein a conductive member is disposed between the negative electrode and the first part of the container, said conductive member being electronically connected to the first part of the container and having at least one segment embedded within the negative electrode such that upon partial electrochemical consumption of the negative electrode and expansion of the positive electrode to a predetermined amount during discharge of the cell, the protruded segment of the conductive member will be disposed to contact the positive electrode so as to internally short the cell.

---

## 4,129,687
## REACTION CATALYST FOR THE ELIMINATION OF OXYHYDROGEN GAS IN LEAD-ACID STORAGE BATTERIES

Norbert Lahme, Hoppecke, and Günter Sassmannshausen, Brilon, both of Germany, assignors to Accumulatorenwerk Hoppecke, Cologne, Germany

Division of Ser. No. 341,577, Mar. 15, 1973, Pat. No. 3,940,348.
This application Jun. 24, 1975, Ser. No. 589,874
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1972, 2213219
Int. Cl.[2] H01M *10/52*
U.S. Cl. 429—86 9 Claims

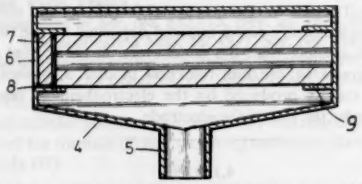
1. A device for the catalytic recombination of the oxyhydrogen gas produced by an electrical storage battery into water in a controlled exothermic reaction, comprising in combination:

a gas-tight catalyst housing;

means extending from the housing for establishing communication between the inside of the catalyst housing and the inside space of the storage battery above its electrolyte; and

catalyst means positioned inside the catalyst housing for catalyzing said recombination of the oxyhydrogen gas,

consisting essentially of a unitary solid catalyst carrier body having a generally cylindrical shape and carried on




the surface of said carrier body an active catalytic material for said recombination reaction.

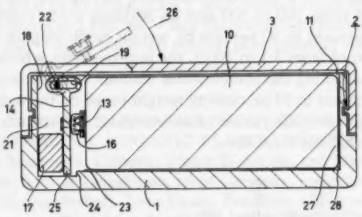
---

**4,129,688**

## BATTERY COMPARTMENT IN PORTABLE APPARATUS

**Karl Fischer, and Walter Matetschlager, both of Vienna, Austria, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Feb. 13, 1978, Ser. No. 877,381**
**Claims priority, application Austria, Feb. 18, 1977, 1124/77**
**Int. Cl.[2] H01M *2/20***
**U.S. Cl. 429—97** **6 Claims**




1. A portable electronic apparatus having a battery compartment for accommodating a battery having contacts for making electrical connection, and a contact carrier having a complementary contact for electrical connection to one of said battery contacts, said battery compartment having a side wall, and further comprising:

means for mounting said carrier for pivotal motion out of the battery compartment, and for translation in a direction perpendicular to said side wall, and

means for resiliently biasing said carrier in a direction opposite said direction.

---

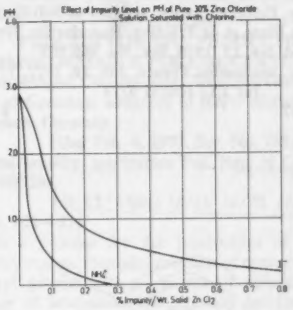
**4,129,689**

## ELECTRO-CHEMICAL CELLS

**Kenneth Henson, Ramsbottom, England, assignor to Unigate Limited, London, England**

**Continuation-in-part of Ser. No. 500,785, Aug. 26, 1974, abandoned. This application Aug. 10, 1976, Ser. No. 713,153**
**Claims priority, application France, Aug. 23, 1974, 74 28931**
**Int. Cl.[2] H01M *10/00, 4/96***
**U.S. Cl. 429—101** **6 Claims**

1. A zinc chloride rechargeable cell comprising a container, at least one cathode element therein comprising a substate of a metal or mixture of metals selected from Groups IVA and VA of the Periodic Table according to Mendeleef having had applied thereto a layer of porous carbon with sufficient pressure to break the oxide film present on said metal or mixture of metals and to form permanent electrical contact between said carbon and said metal or mixture, wherein said layer of porous carbon occludes chlorine gas to form said cathode element and said substrate acts as a current collector, at least one zinc bearing electrode within said container and a substantially




nitrogen free zinc chloride electrolyte in said casing having a pH value of not less than 1.0.

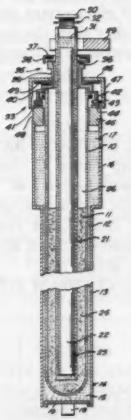
---

**4,129,690**

## SODIUM SULPHUR CELLS

**Ivor W. Jones; Graham Robinson, and Thomas L. Bird, all of Chester, England, assignors to The Electricity Council, London, England**

**Continuation-in-part of Ser. No. 721,907, Sep. 9, 1976, Pat. No. 4,061,840, which is a continuation-in-part of Ser. No. 550,072, Feb. 14, 1975, Pat. No. 3,982,957. This application Oct. 13, 1977, Ser. No. 842,013**
**Claims priority, application United Kingdom, Feb. 15, 1974, 4884/75**
**The portion of the term of this patent subsequent to Sep. 28, 1993, has been disclaimed.**
**Int. Cl.[2] H01M *10/39***
**U.S. Cl. 429—104** **4 Claims**

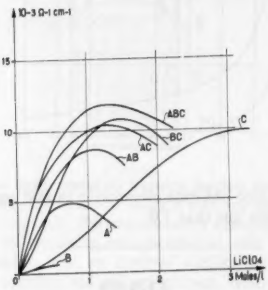


1. In a sodium sulphur cell having a current collector in contact with the cathodic reactant, the improvement wherein said current collector is formed of a tube of electrically conductive impermeable material chemically and electrochemically inert to the cathodic reactant, a conductive core within said tube and extending along the length thereof, said core being of a solid material having an electrical conductivity greater than that of the tube, and a deformable electronically conductive material extending between the core and the internal surface of the tube to constitute an electrically conductive interface between the core and the inner face of the tube.

## 4,129,691
## ORGANIC SOLVENT ELECTROLYTES FOR HIGH SPECIFIC ENERGY PRIMARY CELLS

Michel Broussely, Poitiers, France, assignor to Saft-Societe des Accumulateurs Fixes et de Traction, Romainville, France

Filed Jan. 13, 1978, Ser. No. 869,253
Claims priority, application France, Jan. 19, 1977, 77 01434
Int. Cl.[2] H01M 6/14
U.S. Cl. 429—197 6 Claims



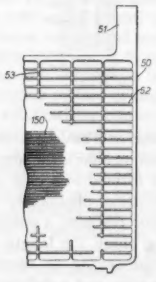

1. An electrolyte for lithium primary cells, comprising a mixture of three aprotic solvents which are compatible with lithium and a solute which is an alkaline salt, the first solvent being chosen from a first group of esters having a dielectric constant equal to or greater than 35, the first group consisting of propylene carbonate (PC) and ethylene carbonate (EC), the second solvent being chosen from a second group of linear polyethers in which the ether functional groups are in the γ position, the second group consisting of 1-2 dimethoxyethane (1—2 DME), dimethylether of diethylene glycol (DMEDG), and dimethylether of triethylene glycol (DMETG), and the third solvent having a high solvation power for dissolving large quantities of an alkaline salt and consisting of 1-3 dioxolane (DO), the solvents of the three groups being such that the conductivity maxima of electrolytes obtained by mixing the solvents in pairs are higher than the conductivity maxima of electrolytes obtained from each of the corresponding solvents alone.

---

## 4,129,692
## ELECTRIC STORAGE BATTERIES

Walter J. King, Pinner; James C. Snook, Altrincham, and Kenneth Peters, Manchester, all of England, assignors to Chloride Group Limited, London, England

Filed Mar. 2, 1977, Ser. No. 773,694
Claims priority, application United Kingdom, Mar. 11, 1976, 9876/76; Apr. 15, 1976, 15665/76
Int. Cl.[2] H01M 4/72
U.S. Cl. 429—234 13 Claims




1. An electrode structure for an electrochemical cell comprising a porous fibrous support made of thermoplastic organic polymeric fiber material selected from the group consisting of polyolefins and polyesters, which is 0.1 to 3 mm. thick, having cast thereon and bonded thereto a pattern of solid conductors extending over the surface of the porous support from a current take off region to regions spaced therefrom, and containing electrochemically active material deposited on the fibrous support, in contact with the conductors, in an amount of at least 0.1 grams/sq. cm/mm thickness in such a manner that electrical energy produced by the electrochemical reaction can be conducted out of the electrode.

---

## 4,129,693
## URETHANE-MODIFIED ISOCYANURATE FOAMS HAVING ENHANCED PHYSICAL PROPERTIES

Moses Cenker, Trenton, and Peter T. Kan, Plymouth, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

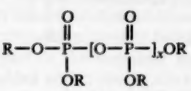
Filed Dec. 20, 1976, Ser. No. 752,273
Int. Cl.[2] C08G 18/48; C08K 3/32
U.S. Cl. 521—106 11 Claims

1. In a foam characterized by urethane, isocyanurate and carbodiimide linkages prepared in the presence of

a. a halohydrocarbon blowing agent, and

b. a catalytically sufficient amount of a catalyst system comprising compounds which promote the urethane, isocyanurate and carbodiimide reactions

by condensing an organic polyisocyanate with an ethylene oxide adduct of a polyhydric alcohol having an equivalent weight of from 100 to 500 and an ethylene oxide content of from 50 percent to 90 percent by weight employing an NCO-/OH ratio of from 3:1 to 100:1, the improvement which comprises conducting the condensation reaction in the presence of from 5 percent to 50 percent by weight based on the weight of the organic polyisocyanate of an inorganic ammonium phosphate having the formula:



wherein

R is H or $NH_4$ providing that at least one R is $NH_4$, and

x is from 0 to 100.

---

## 4,129,694
## FABRIC SOFTENER URETHANE FOAM AND METHOD

Joseph A. Cogliano, Baltimore, and Clifton L. Kehr, Silver Spring, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Apr. 7, 1976, Ser. No. 674,695
Int. Cl.[2] C08G 18/14, 18/10, 18/32, 18/38
U.S. Cl. 521—107 9 Claims

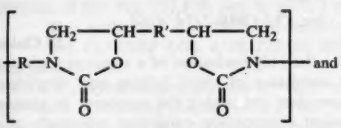
1. In a cross-linked hydrophilic polyurethane foam system having three-dimensional network which consists essentially of the reaction product of a first component comprising isocyanate capped hydrophilic polyoxyethylene polyol resin prepolymer with an isocyanate functionality equal to 2 and crosslinking agent having a reaction functionality greater than two, said crosslinking agent selected from the group consisting of polyol, polyamine, polythiol or polyisocyanate; or said isocyanate capped polyol with an isocyanate functionality greater than 2; and a second component comprising water, wherein the $H_2O$ Index Value of said isocyanate capped polyol and water is about 1,300 to about 78,000, wherein the polyoxyethylene polyol moiety has a weight average molecular weight of about 200 to about 20,000, and a hydroxyl functionality of about 2 to about 8, the improvement which consists essentially of inclusion of a fabric softener during foaming reaction, at least 200% of said fabric softener being present in the foam,

## 4,129,695
## PROCESS FOR PREPARING FOAMS FROM POLYISOCYANATES AND POLYEPOXIDES

Yves Bonin, Brignais, France, assignor to Rhone-Poulenc Industries, Paris, France

Continuation of Ser. No. 633,613, Nov. 20, 1975, abandoned. This application Mar. 16, 1977, Ser. No. 778,258
Claims priority, application France, Nov. 20, 1974, 74 38109
Int. Cl.[2] C08G *18/14, 18/18, 18/22, 18/16*
U.S. Cl. 521—108 18 Claims

1. A cellular polymer comprised of recurring dioxazolidone units of the formula (I) and recurring carbodiimide units of the formula (II):



(I)

(II)

wherein R and R′ may be the same or different and each represents a hydrocarbon selected from the group consisting of aliphatic, cycloaliphatic and aromatic groups and linear or branched chains thereof, wherein the ratio between the number of recurring dioxazolidone units of formula (I) and the number of recurring carbodiimide units of formula (II) is from about 0.5:0.05 to about 0.5:9.5, and characterized by carbodiimide bands at 2,140 $cm^{-1}$ and carbonyl-oxazolidone bands at 1,715 $cm^{-1}$ upon infra-red spectro photographic analysis.

## 4,129,696
## PROCESS FOR THE PRODUCTION OF INORGANIC-ORGANIC PLASTIC COMPOSITES

Peter Markusch, Cologne; Dieter Dieterich, and Manfred Dietrich, both of Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 5, 1976, Ser. No. 664,126
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1975, 2512170
Int. Cl.[2] C08G *18/14*
U.S. Cl. 521—154 19 Claims

1. A process for the production of hard inorganic-organic plastics consisting of a polymer-polysilica gel composite material in the form of a solid/solid xerosol, said process comprising reacting

(A) an aqueous alkali metal silicate solution with

(B) a polyisocyanate, said polyisocyanate being a liquid polyisocyanate, free from hydrophilic groups with a viscosity at 25° C. of at least about 500 cP and having an average functionality of greater than 2, and being selected from the group consisting of

(i) phosgenation products of condensates of aniline or anilines alkylsubstituted on the nucleus, with aldehydes or ketones;

(ii) solutions of distillation residues accumulating during the production of tolylene diisocyanate, diphenyl methane diisocyanate, or hexamethylene diisocyanate, in monomeric polyisocyanates or in organic solvents;

(iii) mixtures of said distillation residues; and

(iv) modified polyisocyanates containing carbodiimide groups, allophanate groups, isocyanurate groups, urea groups, imide groups, amide groups or biuret groups, said modified polyisocyanates prepared by modifying organic polyisocyanates thermally or catalytically by air, water, urethanes, alcohols, amides, amines, carboxylic acids, or carboxylic acid anhydrides;

said reaction being conducted in the absence of inorganic water-binding fillers, and further being characterized in that the weight ratio of said polyisocyanate to said aqueous alkali metal silicate is from 90:10 to 10:90.

7. The process of claim 1, wherein the reaction is accompanied by foam formation.

## 4,129,697
## PROCESS FOR THE PRODUCTION OF THERMOFORMABLE POLYISOCYANURATE FOAMS

Dietmar Schäpel, Cologne, and Ulrich von Gizycki, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 4, 1977, Ser. No. 765,490
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1976, 2607380
Int. Cl.[2] C08G *18/14, 18/76, 18/65*
U.S. Cl. 521—176 5 Claims

1. In a process for the production of thermoformable polyisocyanurate foams by reaction of compounds which have hydroxyl groups with an excess of polyisocyanates in the presence of isocyanate trimerization catalysts, and blowing agents, the improvement which comprises reacting a polymethylene polyphenyl polyisocyanate which contains at least 80% by weight of diisocyanatodiphenylmethane and a mixture of

(a) polyethers containing at least one hydroxyl group and having an OH number of from 28 to 112, in which at least 20% by weight of the alkylene oxide component consists of ethylene oxide groups, and

(b) dihydric alcohols which have a molecular weight of from 62 to 200,

said polyethers being used in a quantity corresponding to from 0.015 to 0.04 equivalents of OH per equivalent NCO and the dihydric alcohols being used in a quantity corresponding to from 0.2 to 0.4 equivalents of OH per equivalent of NCO.

## 4,129,698
## POLYMERS MODIFIED BY SULFOSUCCINAE ESTERS

Anthony J. Park, South Croydon, and Alan C. Sturt, Guildford, both of England, assignors to BP Chemicals International Limited, London, England

Continuation of Ser. No. 615,573, Sep. 22, 1977, abandoned, which is a continuation of Ser. No. 384,715, Aug. 1, 1973, abandoned. This application Jun. 24, 1977, Ser. No. 809,668
Claims priority, application United Kingdom, Aug. 16, 1972, 38199/72; Aug. 16, 1972, 38200/72
Int. Cl.[2] C08F *6/14, 2/26*
U.S. Cl. 526—3 9 Claims

1. A process for the production of a vinyl chloride paste forming polymer having reduced paste viscosity at high and low shear which comprises preparing a paste forming vinyl chloride polymer latex by microsuspension polymerization using an emulsifier other than a sulfosuccinate during said polymerization, adding a sulfosuccinate emulsifier to said paste forming vinyl chloride latex after polymerization is substantially complete and then subsequently isolating as particles the paste forming polymer in the presence of said emulsifier.

## 4,129,699
## PROCESS FOR THE HYDROHALOGENATION OF BUTA-DIENE-CONTAINING POLYMERS

Harold E. Adams, Cuyahoga Falls; Stephen P. Boutsicaris, Akron, and Adel F. Halasa, Bath, all of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Aug. 25, 1977, Ser. No. 827,506
Int. Cl.[2] C08F *8/18*
U.S. Cl. 526—42 10 Claims

1. A process for the hydrohalogenation of butadiene-containing polymer comprising the steps of:

dissolving the butadiene-containing polymer in a suitable organic solvent containing a catalytic amount of a quaternary ammonium salt having the formula $(R_4N)X$ wherein R is selected from the group consisting of alkyl groups having from 1 to about 20 carbon atoms, aryl groups having from 6 to about 12 carbon atoms and mixtures

thereof, and X is selected from the group consisting of fluorine, chlorine, bromine and iodine;
adding an aqueous hydrogen halide having the formula HX wherein X is selected from the group consisting of fluorine, chlorine, bromine and iodine;
mixing the reactants for a period of time of at least about 48 hours at a temperature of about 50° to 150° C.; and,
thereafter terminating the reaction and extracting the hydrohalogenated product.

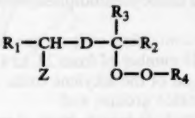
---

## 4,129,700
## PEROXY COMPOUNDS AND VULCANIZABLE COMPOSITIONS THEREOF

**Orville L. Mageli, Kenmore, N.Y., and William A. Swarts, Dover, N.J., assignors to Pennwalt Corporation, Philadelphia, Pa.**

**Filed Jul. 17, 1975, Ser. No. 596,778**
**Int. Cl.² C08F *8/30***
**U.S. Cl. 260—823** **8 Claims**

1. A peroxy compound of the formula:



where:
(a) $R_1$ is hydrogen or an alkyl of 1–4 carbons;
(b) $R_2$ and $R_3$ are an alkyl of 1–4 carbons;
(c) $R_4$ is t-alkyl of 4–8 carbons;
(d) Z is

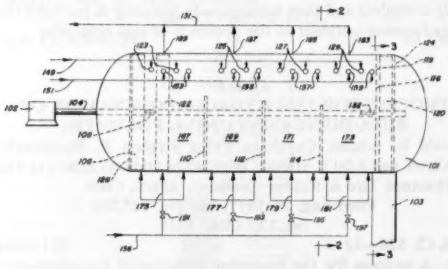
(e) $R_6$ and $R_8$ are independently H, alkyl of 1–8 carbons;
(f) D is ethynyl diradical diethynyl diradical or alkyl diradical having 1–8 carbons.

---

## 4,129,701
## HORIZONTAL REACTOR FOR THE VAPOR PHASE POLYMERIZATION OF MONOMERS

**James L. Jezl, St. Charles, and Edwin F. Peters, Winfield, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.**

**Continuation of Ser. No. 533,020, Dec. 16, 1974, abandoned. This application Dec. 19, 1975, Ser. No. 642,583**
**Int. Cl.² C08F *10/00, 12/08, 14/06, 36/06***
**U.S. Cl. 526—65** **12 Claims**



1. A continuous process for the vapor phase polymerization of at least one polymerizable monomer in a stirred, horizontal, reactor containing a subfluidized particulate polymer bed wherein at least a portion of the heat of polymerization is removed by evaporative cooling using an inert readily volatilizable liquid, said reactor being divided into two or more individually polymerization-temperature-controllable polymerization sections by one or more barriers so constructed to allow free gas mixing within said reactor and to control movement of said particulate between said sections.

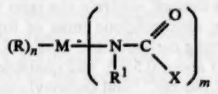
---

## 4,129,702
## POLYMERIZING UNSATURATED HALIDES WITH CARBAMATE TYPE METALLIC CATALYST

**Philip D. Roberts; Geoffrey L. P. Randall; David G. Simon, and Jeffrey Booth, all of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England**

**Filed Jul. 18, 1974, Ser. No. 489,716**
**Claims priority, application United Kingdom, Aug. 19, 1973, 34468/73**
**Int. Cl.² C08F *2/34, 4/64***
**U.S. Cl. 526—71** **25 Claims**

1. A process for the polymerisation of a monomer selected from the group consisting of vinyl halides and vinylidene halides which comprises contacting the monomer in gaseous form with a catalyst composition consisting essentially of a mixture of, as first component, a compound of a transition metal selected from Groups IVA to VIA of the Periodic Table of the Elements and, as second component, the product obtained by ageing a compound having the structure



wherein M is aluminium or zinc, at least one of the groups R is a hydrocarbon group, n and m each is an integer not greater than one less than the valency of M, $R^1$ is hydrogen or a hydrocarbon group, and X is hydrogen or a monovalent organic group, and removing the resulting organic monoisocyanate as it is liberated, said catalyst composition having an atomic ratio of aluminium or zinc to transition metal in the range of 1:1 to 10:1 and a concentration in the monomer in the range of about 0.0025 to about 0.1 mole percent of transition metal.

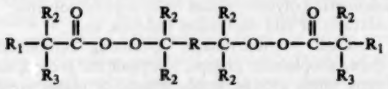
---

## 4,129,703
## FREE-RADICAL POLYMERIZATIONS USING MIXED INITIATOR SYSTEMS AT TWO THERMALLY DISTINCT POLYMERIZATION STAGES

**Vasanth R. Kamath, Tonawanda, and Gary A. Harpell, Kenmore, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.**

**Filed Jan. 6, 1977, Ser. No. 757,186**
**Int. Cl.² C08F *4/38, 2/18, 2/02, 12/08***
**U.S. Cl. 526—73** **11 Claims**

1. A process for the free-radical polymerization of vinyl monomers, including vinyl aromatic monomers, comprises polymerizing said vinyl monomers in at least two thermally distinct polymerization stages, each between the temperatures of about 70° C. and 150° C. in the presence of at least two free-radical initiators, one of which initiators is particularly effective at the lowest temperature stage and has the formula



(I)

and where R is an alkylene, alkynylene or alkenylene diradical, $R_1$ is alkyl, alkenyl, alkynl or alkoxy and $R_2$ is lower alkyl and $R_3$ is hydrogen or lower alkyl and a second of which initiators have a 10 hour half-life temperature of at least about 80° C., said temperature being at least about 15° C. above the 10 hour half-life temperature of the compound of Formula (I) wherein the same solvent is used for measuring the half-life of all initia-

tors, wherein the initiator of Formula (I) allows completing the polymerization in a shorter time with the resulting polymer having a higher viscosity-average molecular weight than without the initiator of Formula (I).

---

## 4,129,704
## POLYMERIZATION OF VINYL MONOMERS EMPLOYING A DIPEROXYESTER MIXTURE COMPOSITION PREPARED BY REACTING DIHYDROPEROXIDE AND PEROXYESTER FORMING CARBONYL COMPOUNDS

**Jose Sanchez, Grand Island, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.**

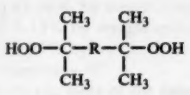
**Division of Ser. No. 757,179, Jan. 6, 1977, Pat. No. 4,097,408. This application Jan. 25, 1978, Ser. No. 872,391**

**Int. Cl.[2] C08F *4/36, 4/38, 112/08;* B01J *31/02***

**U.S. Cl. 526—73** **3 Claims**

1. In a polymerization process of vinyl monomer the improvement comprising polymerizing a vinyl monomer using in an initiating amount as catalyst a diperoxyester mixture composition prepared by:

reacting 100 mole percent of a dihydroperoxide having the structure:



wherein

R is selected from the group consisting of an alkylene diradical of 2 to 4 carbons, an alkynylene diradical of 2 carbons, an alkadiynylene diradical of 4 carbons, 1,3 phenylene diradical and 1,4 phenylene diradical,

in the presence of 190 to 300 mole percent of a base with 180 to 220 total mole percent of at least two peroxyester forming carbonyl compounds selected from the group consisting of:

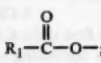
a)

wherein

i. $R_1$ is selected from a primary alkyl, alkyloxy, aryl, aryloxy, primary alkenyl, alkenyloxy, or cycloalkoxy, and

ii. $Y_1$ is selected from chloride, bromide or

b)

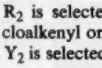


wherein

i. $R_2$ is selected from a primary aralkyl, cycloalkyl, cycloalkenyl or secondary alkyl, and

ii. $Y_2$ is selected from chloride, bromide or

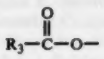
c)



wherein

i. $R_3$ is selected from a tertiary alkyl, secondary and tertiary aralkyl, or tertiary cycloalkyl, 1-alkoxy-1-alkyl, 1-aryloxy-1-alkyl, α-alkoxy-tertiary alkyl or α-aryloxy-tertiary alkyl, and

ii. $Y_3$ is selected from chloride, bromide or



---

## 4,129,705
## POLYMERIZATION PROCESS

**Yves de Zarauz, Le Cendre, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France**

**Filed Jan. 13, 1977, Ser. No. 758,941**

**Claims priority, application France, Feb. 2, 1975, 75 04115**

**Int. Cl.[2] C08F *4/52***

**U.S. Cl. 526—175** **8 Claims**

1. A process of homopolymerizing conjugated dienes or copolymerizing conjugated dienes with other conjugated dienes or with vinyl aromatic compounds to form elastomeric products which consists essentially of reacting the monomers in the presence of a catalytic composition consisting essentially of (a) an organo-lithium initiator and (b) a tercatalyst system comprising ($b_1$) a compound of barium or strontium or calcium, ($b_2$) an organometallic compound of aluminum or zinc and ($b_3$) an alkali metal alcoholate ether or amine.

---

## 4,129,706
## MANUFACTURE OF STYRENE SUSPENSION POLYMERS

**Hans G. Keppler, Weinheim; Erhard Stahnecker, Heidelberg, and Rolf Moeller, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen am Rhein, Fed. Rep. of Germany**

**Filed Aug. 17, 1977, Ser. No. 825,277**

**Claims priority, application Fed. Rep. of Germany, Aug. 28, 1976, 2638839**

**Int. Cl.[2] C08F *12/08***

**U.S. Cl. 526—201** **8 Claims**

1. A process for the manufacture of homopolymers of styrene or copolymers of styrene containing at least 50% by weight of styrene by polymerizing the monomers in aqueous suspension in the presence of suspension stabilizers, in which the suspension stabilizer used is from 0.05 to 1 percent by weight, based on the suspension, of a calcium phosphate which, after its manufacture by precipitation, has been heated, in aqueous dispersion, for at least 2 hours at from 70° to 130° C.

---

## 4,129,707
## BEAD SIZE DISTRIBUTION IN THE SUSPENSION POLYMERIZATION OF VINYL AROMATIC MONOMERS EMPLOYING AMINOALKANESULFONIC ACIDS

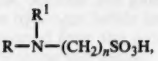
**Harold A. Wright, Murrysville, Pa., assignor to ARCO Polymers, Inc., Philadelphia, Pa.**

**Filed Dec. 27, 1977, Ser. No. 864,187**

**Int. Cl.[2] C08F *2/18, 12/02, 112/02, 112/08***

**U.S. Cl. 526—204** **8 Claims**

1. In a process for producing polymer beads by suspending a vinyl aromatic monomer containing a monomer-soluble, free-radical producing catalyst in an aqueous medium with the aid of from 0.10 to 2.0 percent by weight based on monomer of a finely divided, difficultly water-soluble phosphate suspending agent and a bisulfite or persulfate modifier and subjecting the suspension to an elevated temperature to cause said monomer to polymerize, the improvement for producing a narrow distribution of bead diameter sizes which comprises adding to said suspension at least 0.02 percent by weight based on monomer of an adjunct modifier comprising a compound of general formula



where n is 2 or 3, R and $R^1$ may be the same or different and R and $R^1$ may be hydrogen, 2-hydroxyethyl, 2-acetamido, tris (hydroxymethyl) methyl, cyclohexyl, or R and $R^1$ together may form ring structures such as morpholino, piperazino, and N'-(2-hydroxyethyl) piperazino.

---

**4,129,708**

## POLYACRYLATE ELASTOMER COMPOSITIONS

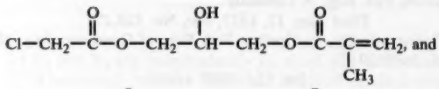
**Guido Mino, Murray Hill, and Rudolf A. Behrens, Gladstone, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.**

**Continuation of Ser. No. 788,172, Apr. 18, 1977, which is a continuation of Ser. No. 683,610, May 5, 1976, abandoned, which is a continuation of Ser. No. 615,873, Sep. 22, 1975, abandoned, which is a continuation of Ser. No. 452,318, Mar. 18, 1974, abandoned, which is a continuation of Ser. No. 287,305, Sep. 8, 1972, abandoned, which is a continuation-in-part of Ser. No. 119,963, Mar. 1, 1971, abandoned. This application Oct. 7, 1977, Ser. No. 840,194**

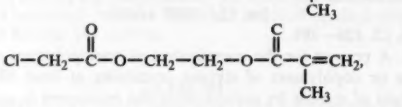
**Int. Cl.[2] C08F** *4/04, 4/32, 4/40*

**U.S. Cl. 526—218** **18 Claims**

1. A vulcanizable polyacrylate elastomer composition having improved resistance to hydrocarbon oils which comprises one or more lower alkyl acrylic acid ester monomers copolymerized with a monomer selected from the group consisting of β-chloroethyl vinyl ether, vinyl chloroacetate, β-chloroethyl acrylate, allyl glycidyl ether, glycidyl methacrylate and compounds having the formulae



and



in the presence of from about 0.25 to 10 percent, by weight, of total monomer, of a liquid unsaturated, hydroxyl or aromatic hydrocarbon terminated homopolymer of butadiene or isoprene, or copolymers thereof with minor amounts of styrene or acrylonitrile, having a monomeric weight of from about 500 to 4,000 and containing from about 75% to 99% unsaturation, based on the monomeric butadiene or isoprene in the polymer.

---

**4,129,709**

## COATING COMPOSITION COMPRISING N-VINYL-2-PYRROLIDONE AND AN OLIGOMER

**Donald H. Lorenz, Basking Ridge, and Shu-Tung Tu, East Brunswick, both of N.J., assignors to GAF Corporation, New York, N.Y.**

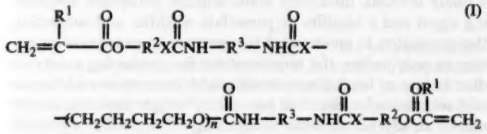
**Filed Mar. 14, 1977, Ser. No. 777,031**

**Int. Cl.[2] C08F** *120/02*

**U.S. Cl. 526—264** **8 Claims**

1. A coating composition comprising;

A. an oligomer of Formula I:



(I)

wherein:

$R^1$ is hydrogen or methyl;

$R^2$ is lower alkylene;

$R^3$ is saturated aliphatic or cycloaliphatic;

X is —O— or —NH—;

*n* is an integer from 2 to 50 inclusive;

B. N-vinyl-2-pyrrolidone;

C. an acrylic acid ester having a boiling point of at least 200° C. at 760 mm Hg,

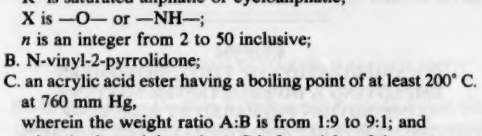
wherein the weight ratio A:B is from 1:9 to 9:1; and

wherein the weight ratio A:C is from 1:9 to 9:1.

7. A process for coating a substrate comprising in sequence the steps of:

I. contacting the substrate with a coating composition comprising:

A. an oligomer of Formula I:



(I)

wherein:

$R^1$ is hydrogen or methyl;

$R^2$ is lower alkylene;

$R^3$ is aliphatic or cycloaliphatic;

X is —O— or —NH;

*n* is an integer from 2 to 50 inclusive;

B. N-vinyl-2-pyrrolidone;

C. an acrylic acid ester having a boiling point of at least 200° C. at 760 mm Hg. and a photo-initiator to form a coated substrate,

II. exposing the coated substrate to radiation until an adherent dry polymerized coating is formed on the substrate.

---

**4,129,710**

## FIRE RETARDANT COPOLYMER OF TRIALLYL PHOSPHATE AND A BIS (HYDROCARBYL) VINYLPHOSPHONATE

**Jung I. Jin, Irvington, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.**

**Continuation of Ser. No. 496,233, Aug. 9, 1974, abandoned. This application Dec. 6, 1976, Ser. No. 748,071**

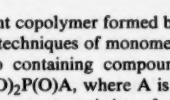
**Int. Cl.[2] C08F** *36/20, 36/22, 236/20*

**U.S. Cl. 526—278** **8 Claims**

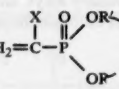
1. A flame retardant copolymer formed by free radical initiated polymerization techniques of monomers consisting of:

(1) an allyl group containing compound of the formula $(CH_2{=}CHCH_2O)_2P(O)A$, where A is OR, with R being selected from the group consisting of vinyl, allyl, $C_1$-$C_{10}$ allyl and aryl; and

(2) at least one bis(hydrocarbyl)vinylphosphonate having the structure:



wherein X is selected from the group consisting of hydrogen, halogen, cyano, aryl, $C_1$-$C_{18}$ alkyl and



where R and R' are hydrocarbyl and substituted hydro-

carbyl groups which can be the same, different or conjoint.

---

4,129,711

## POLYMERS COMPRISING VINYL ESTERS-CROTONIC ACID

**Andre Viout, and Regine Pasero, both of Paris, France, assignors to L'Oreal, Paris, France**

**Division of Ser. No. 309,502, Nov. 24, 1972, Pat. No. 3,925,542, which is a continuation-in-part of Ser. No. 747,470, Jul. 25, 1968, Pat. No. 3,716,633, which is a continuation-in-part of Ser. No. 655,770, Jul. 28, 1967, Pat. No. 3,579,629, which is a continuation-in-part of Ser. No. 530,395, Feb. 28, 1966, abandoned. This application Aug. 1, 1975, Ser. No. 601,017**

**Claims priority, application France, Mar. 3, 1965, 65.7787; Jan. 27, 1966, 66.47441; Aug. 3, 1966, 66.71998; Luxembourg, Jul. 28, 1967, 54202**

**Int. Cl.[2] C08F** *4/34, 20/04, 220/04, 28/04*

**U.S. Cl. 526—286** **9 Claims**

1. A copolymer consisting essentially of

(1) 63–88% by weight vinyl acetate,

(2) 5–15% by weight crotonic acid and

(3) 5–25% by weight of a monomer selected from the group consisting of

(i) vinylic ester of the formula

$$R - COO - CH = CH_2$$

wherein R is a linear or branched chain hydrocarbon containing from 10 to 22 carbon atoms, and

(ii) allylic or methallylic ester of the formula

$$R'-COO-CH_2-\underset{\displaystyle R''}{\underset{|}{C}}=CH_2$$

wherein R' is a linear or branched chain hydrocarbon containing 10 to 22 carbon atoms and R'' is selected from the group consisting of hydrogen and methyl, wherein all of the monomers are copolymerized in the presence of a free radical catalyst, said copolymer having a molecular weight ranging between 10,000 and 300,000.

---

4,129,712

## INTERPOLYMERS, METHOD OF PREPARING THE SAME AND EMULSIONS THEREOF, AND METAL CANS COATED WITH THE INTERPOLYMERS

**Sergio E. Balatan, Westland, Mich., assignor to M&T Chemicals Inc., Stamford, Conn.**

**Division of Ser. No. 715,063, Aug. 17, 1976, abandoned. This application Jul. 18, 1977, Ser. No. 816,669**

**Int. Cl.[2] C08L** *33/02*

**U.S. Cl. 526--304** **1 Claim**

1. Copolymers having glass transition temperature of about −6° C. to about +30° C., containing by weight:

15 to 60% of aromatic vinyl monomer

25 to 50% of a long chain acrylate ester monomer

3 to 30% of an hydroxyalkyl ester of an unsaturated carboxylic acid monomer

3 to 30% of alkoxyalkyl (meth) acrylamide

0 to 12% of unsaturated carboxylic acid monomer, said acid producing an insoluble polymer in water, and an amount of surfactant to produce a stable emulsion.

4,129,713

## LIQUID VINYLIDENE TERMINATED POLYMERS

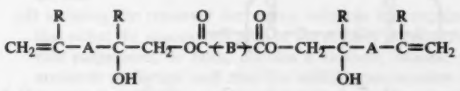
**Douglas E. Skillicorn, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio**

**Division of Ser. No. 585,962, Jun. 11, 1975, Pat. No. 4,013,710, which is a division of Ser. No. 292,926, Sep. 28, 1972, Pat. No. 3,910,992. This application Nov. 3, 1976, Ser. No. 738,195**

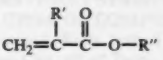
**Int. Cl.[2] C08F** *220/18, 8/14*

**U.S. Cl. 526—320** **5 Claims**

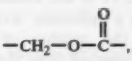
1. A liquid vinylidene-terminated polymer having a molecular weight of from about 1000 to about 20,000 as measured using a Mechrolab Vapor Pressure Osmometer of the structure



wherein B is a polymeric backbone of carbon-carbon linkages derived from interpolymerized units of one or more acrylates of the formula



wherein R' is —H, —$CH_3$, or —$C_2H_5$, and R'' is selected from the group consisting of an alkyl radical containing 1 to 18 carbon atoms, an alkoxyalkyl radical, an alkylthioalkyl, and a cyanoalkyl radical each containing 2 to about 12 carbon atoms; A is a bivalent radical selected from the group consisting of



—$CH_2$—O—$CH_2$—, and —$CH_2$—O—; and R is hydrogen or an alkyl radical containing 1 to 4 carbon atoms.

---

4,129,714

## ETHYLENE COPOLYMERS AND TERPOLYMERS CONTAINING VINYL ESTERS OF TERTIARY ACIDS

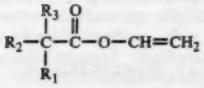
**Samuel E. Colburn, Atwood; Duane K. Bryant, Charleston, both of Ill.; Gerald M. Platz, West Chester, Ohio, and Clarence J. Vetter, Jr., Atwood, Ill., assignors to National Distillers and Chemical Corporation, New York, N.Y.**

**Continuation of Ser. No. 350,255, Apr. 11, 1973, abandoned, which is a continuation of Ser. No. 123,003, Mar. 10, 1971, abandoned, which is a continuation-in-part of Ser. No. 861,165, Sep. 25, 1969, abandoned. This application Jul. 15, 1976, Ser. No. 705,509**

**Int. Cl.[2] C08F** *210/02, 218/10*

**U.S. Cl. 526—331** **8 Claims**

1. A normally solid interpolymer consisting essentially of from 30 to 98 weight percent of ethylene, from 0.1 to 70 weight percent of a tertiary carboxylic acid vinyl ester monomer mixture having the formula



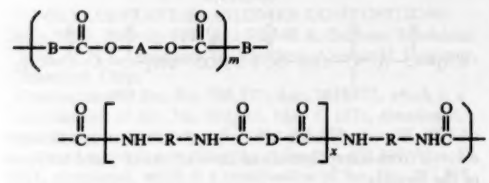
wherein $R_1$, $R_2$ and $R_3$ are alkyl groups, and the total number of carbon atoms in said $R_1$, $R_2$ and $R_3$ is from 6 to 20, and from 1 to 50 weight percent of vinyl acetate.

## 4,129,715
## POLYESTER AMIDES SUITABLE FOR INJECTION MOLDING

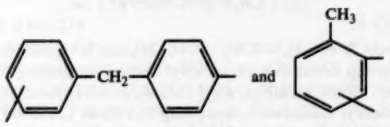
Augustin T. Chen, Cheshire; William J. Farrissey, Jr., Northford, and Robert G. Nelb, II, North Haven, all of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 803,027, Jun. 3, 1977, abandoned. This application Jan. 16, 1978, Ser. No. 869,705
Int. Cl.[2] C08G *18/12;* B29F *1/08;* C08G *18/34*
U.S. Cl. 528—67 14 Claims

1. A substantially linear, segmented thermoplastic polyesteramide characterized by a recurring unit of the formula:



wherein R is selected from the class consisting of arylene of the formulae



and mixtures thereof, A is the residue of a polymeric diol HO—A—OH having a molecular weight from about 400 to about 4000, B is the residue of a dicarboxylic acid HOOC—B—COOH selected from the class consisting of aliphatic dicarboxylic acids having from 6 to 14 carbon atoms, inclusive, isophthalic and terephthalic acids, m has a mean value of less than 1 and greater than 0, D is the residue of a dicarboxylic acid HOOC—D—COOH such that the melt temperature of the hard segment is not greater than 280° C., and x is a number having an average value from zero to 10.

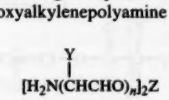
---

## 4,129,716
## UREA-ALDEHYDE RESINS

Heinz Schulze, Austin, Tex., assignor to Texaco Development Corporation, New York, N.Y.

Continuation of Ser. No. 717,062, Aug. 24, 1976, abandoned. This application Jun. 6, 1977, Ser. No. 804,130
Int. Cl.[2] C08G *12/12, 14/02*
U.S. Cl. 528—68 10 Claims

1. In a method for preparing a urea-formaldehyde condensate with the improvement which comprises contacting the aldehyde with a polyether polyureide formed by the reaction of a ureido group forming compound with a compound selected from a polyoxyalkylenepolyamine of the formula



wherein Y is a hydrogen, a methyl radical or an ethyl radical; Z is a hydrocarbon radical having from 2 to 5 carbon atoms and n is a number from 1 to about 20.

## 4,129,717
## LUBRICANTS USED IN THE PROCESSING OF PLASTICS

Heinz Praetorius; Karl Seibert, both of Duren, and Werner Holtvoigt, Lonne-Riessel, all of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed Dec. 14, 1977, Ser. No. 860,509
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1976, 2656932
Int. Cl.[2] C08L *59/00*
U.S. Cl. 528—421 4 Claims

1. A lubricant for use in processing thermoplastic polymers, comprising a random polyalkylene copolymer made from ethylene oxide or propylene oxide, or a mixture thereof, and a monomer selected from the group consisting of aliphatic, non-substituted, 1,2-alkylene oxides containing from about 6 to about 40 carbon atoms, and mixtures thereof, the ethylene oxide or propylene oxide, or mixture thereof, being present in an amount from about 40 to about 60 percent, by weight, based on the total weight of the copolymer and the copolymer having an average molecular weight from about 1,000 to about 10,000.

---

## 4,129,718
## PROCESS FOR THE REMOVAL OF CATALYST FROM POLYETHER POLYOL

John A. Muzzio, Taylor, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 1, 1977, Ser. No. 856,453
Int. Cl.[2] C07C *3/00;* C07H *1/06;* C07C *41/12*
U.S. Cl. 536—4 5 Claims

1. In the process for purifying crude polyoxyalkylene ether polyols containing residual catalyst impurities, said polyols having a molecular weight range of 700 to about 26,000, the improvement which comprises:

(a) adding an adsorbent consisting of synthetic magnesium silicate and water forming a mixture with said crude polyol wherein the amount of adsorbent is from about 0.5 to 3.0 weight percent based on the weight of the polyol and the amount of water is from about 2.0 to 3.0 weight percent based on the weight of the polyol,

(b) heating said mixture at a temperature range from about 80° Centigrade to about 130° Centigrade for at least 45 minutes,

(c) adding sufficient carbon dioxide to saturate the water 15 minutes prior to filtration, and

(d) separating the polyol and the water from the adsorbent by filtration at a temperature from about 90° C. to about 120° C. wherein the residual catalyst impurities are retained on the adsorbent.

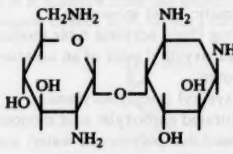
---

## 4,129,719
## 5,6-EPINEAMINE AND PROCESS FOR PREPARING THE SAME

Tetsuo Suami, No. 5-8, Naka-machi 3-chome, Musashina-shi, Tokyo, Japan

Filed May 20, 1977, Ser. No. 799,011
Claims priority, application Japan, May 28, 1976, 51-61246
Int. Cl.[2] C07H *3/10*
U.S. Cl. 536—17 2 Claims

1. 5,6-Epineamine represented by the formula (I)


(I)

## 4,129,720
## AMINOEVERNINOMICIN AND DERIVATIVES THEREOF

**Ashit K. Ganguly, Upper Montclair; Viyyoor M. Girijavallabhan, East Orange; Olga Sarre, Verona, and Hans Reimann, Wayne, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.**

**Continuation-in-part of Ser. No. 768,124, Feb. 14, 1977, abandoned. This application Sep. 16, 1977, Ser. No. 833,838**
**Int. Cl.[2] C07H** *17/04*
**U.S. Cl. 536—17** **24 Claims**

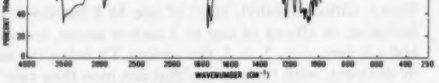
1. A compound selected from the group consisting of aminoverninomicin B, aminoeverninomicin C, aminoeverninomicin D, the N-acyl, N-acyl-N-hydroxyl, N-alky, N,N-dialkyl derivatives and non-toxic pharmaceutically acceptable cationic salts thereof wherein said acyl group is derived from a carboxylic acid having 1 to 12 carbon atoms and said alkyl group is a member selected from the group having 1 to 12 carbon atoms.

---

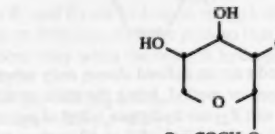
## 4,129,721
## A-40104 ANTIBIOTICS AND PROCESS FOR PRODUCTION THEREOF

**Karl H. Michel, and Calvin E. Higgens, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.**

**Filed Dec. 8, 1977, Ser. No. 858,505**
**Int. Cl.[2] C07G** *11/00*
**U.S. Cl. 536—17** **4 Claims**



1. A member of the group consisting of (1) antibiotic A-40104 factor A which is the $\beta$,D-xylopyranosyl acetal derivative of pleuromutilin having the following structure:



(2) the 19,20-dihydro derivative of A-40104 factor A; and (3) the tetra ($C_2$–$C_6$) alkanoyl derivatives of A-40104 factor A and of 19,20-dihydro A-40104 factor A.

---

## 4,129,722
## PROCESS FOR THE PREPARATION OF HIGH D. S. POLYSACCHARIDES

**Carmine P. Iovine, and Dilip K. Ray-Chaudhuri, both of Bridgewater, N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.**

**Filed Dec. 15, 1977, Ser. No. 860,952**
**Int. Cl.[2] C08B** *11/00, 31/08, 37/00*
**U.S. Cl. 536—43** **11 Claims**

1. A process for the production of a water-soluble or water swellable highly substituted polysaccharide derivative comprising the steps of

(a) suspending a polysaccharide substrate in an organic solvent, which solvent is immiscible with the aqueous derivatizing reagent phase, does not dissolve the reagent or polysaccharide derivative as it is formed, has a boiling point at or above the temperature of the derivatization reaction, is insensitive to alkali and does not participate in the derivatization reaction;

(b) adding thereto an aqueous solution of the derivatizing reagent;

(c) derivatizing the resultant mixture in the presence of alkali if required, with agitation at a temperature of 10° to 100° C.; and

(d) isolating the resultant derivative; wherein it is required that either the aqueous solution or the organic polysaccharide suspension, or both, contain a cationic, anionic or nonionic surfactant and that the solids concentration is greater than 50% by weight of the total aqueous system.

---

## 4,129,723
## BICHROMOPHORIC BENZOXAZOLE-STYRENE ESTER AND AMIDE ULTRAVIOLET STABILIZERS AND THEIR USE IN ORGANIC COMPOSITIONS

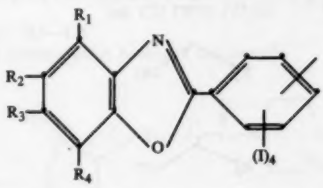
**Gether Irick, Jr.; Charles A. Kelly, both of Kingsport, and James C. Martin, Johnson City, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Division of Ser. No. 714,927, Aug. 16, 1976, Pat. No. 4,062,800. This application Oct. 17, 1977, Ser. No. 842,861**
**Int. Cl.[2] C07D** *263/56;* **C08K** *5/15*
**U.S. Cl. 542—416** **41 Claims**

1. A compound having the formula:

A—B—C

wherein A is a group having the structure

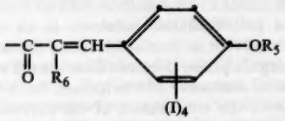


wherein

$R_1$, $R_2$, $R_3$ and $R_4$ are hydrogen, chloro, bromo, lower alkyl, substituted lower alkyl, cycloalkyl, substituted cycloalkyl, aryl, substituted aryl, lower alkylaryl, aryl-substituted-aryl, alkoxy, substituted amino, cyano, carboalkoxy and the substituents $R_1$ and $R_2$, $R_2$ and $R_3$, and $R_3$ and $R_4$, combined with the carbon atoms to which they are attached, are joined alkylene groups completing a carbocyclic ring, which ring can also be substituted with one or more of the substituents listed above for $R_1$, $R_2$, $R_3$ and $R_4$;

I is the same as $R_1$, $R_2$, $R_3$ and $R_4$ and is present on all positions of the benzenoid ring, except the carbon atom attached to the heterocyclic ring and the carbon atom attached to the B group connecting the heterocyclic aromatic A group with the aromatic C group, wherein B is a linking group connecting A and C and can be oxy, oxycarbonylalkyleneoxy, alkyleneoxy, alkyleneoxyalkyleneoxy, oxyalkylenearylenealkyleneoxy, thio, thioalkyleneoxy, aminocarbonylalkyleneoxy, N-alkylaminocarbonylalkyleneoxy, N-arylaminocarbonylalkyleneoxy, N-alkylamino, N-arylamino, N-arylaminoalkyleneoxy, N-alkyleneaminoalkyleneoxy, oxyalkyleneoxy, oxyaryleneoxy; and

wherein C is a group having the formula



where I is the same substituent as listed above and said I substituents can all be one of the substituents listed above or different listed substituents and $R_5$ is an alkyl group containing 1 to 20 carbon atoms and $R_6$ is cyano, carboxamido, alkanoyl or alkylsulfonyl.

---

**4,129,724**

**9-DEOXY-9-METHYLENE-PGF-3,4-DIDEHYDROPIPERIDYLAMIDES**

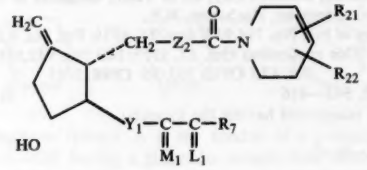
**Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.**

**Continuation-in-part of Ser. No. 786,250, Apr. 11, 1977, Pat. No. 4,098,805. This application Apr. 7, 1978, Ser. No. 894,268**

**Int. Cl.[2] C07C *177/00***

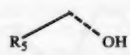
**U.S. Cl. 542—426** **32 Claims**

1. A prostaglandin analog of the formula



wherein $Y_1$ is trans—CH=CH—, —C≡C—, or $—CH_2CH_2—$

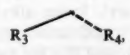
wherein $M_1$ is

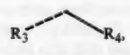


or

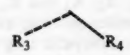
wherein $R_5$ is hydrogen or methyl;

wherein $L_1$ is

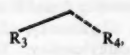




or a mixture of



and



wherein $R_3$ and $R_4$ are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of $R_3$ and $R_4$ is fluoro only when the other is hydrogen or fluoro;

wherein $Z_2$ is

(1) $—(CH_2)_3—(CH_2)_g—CH_2—$,

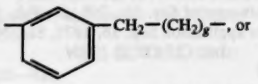
(2) $—(CH_2)_3—(CH_2)_g—CF_2—$,

(3) $—CH_2—O—CH_2—(CH_2)_g—CH_2—$,

(4) $—C≡C—CH_2—(CH_2)_g—CH_2—$,

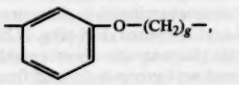
(5) $—CH_2—C≡C—(CH_2)_g—CH_2—$,

(6)



(6)

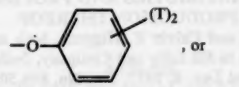
(7)



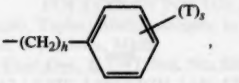
wherein g is one, 2 or 3;

wherein $R_7$ is

(1) $—(CH_2)_m—CH_3$,

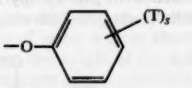


(2)



(3)

wherein m is one to 5, inclusive, h is zero or one, T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, and s is zero, one, 2, to 3, the various T's being the same or different, with the proviso that not moe than two T's are other than alkyl, with the further proviso that $R_7$ is



wherein T and s are as defined above, only when $R_3$ and $R_4$ are hydrogen or methyl, being the same or different; and wherein $R_{21}$ and $R_{22}$ are hydrogen, alkyl of one to 12 carbon atoms, inclusive; aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 3 carbon atoms, inclusive, or phenyl substituted with hydroxycarbonyl or alkoxycarbonyl of one to 4 carbon atoms, inclusive.

---

**4,129,725**

**9-DEOXY-9-METHYLENE-PGF$_1$-PYRROLINYLAMIDES**

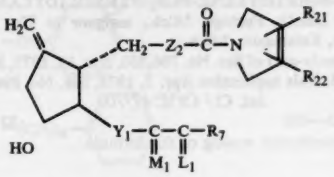
**Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.**

**Continuation-in-part of Ser. No. 786,250, Apr. 11, 1977, Pat. No. 4,098,805. This application Apr. 7, 1978, Ser. No. 894,269**

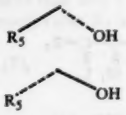
**Int. Cl.[2] C07C *177/00***

**U.S. Cl. 542—426** **32 Claims**

1. A prostaglandin analog of the formula

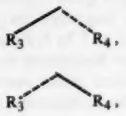


wherein $Y_1$ is trans—CH=CH—, —C≡C—, or —$CH_2$-$H_2$—
wherein $M_1$ is

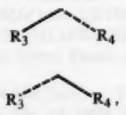


or

wherein $R_5$ is hydrogen or methyl;
wherein $L_1$ is

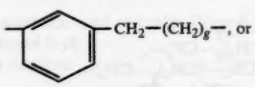


or a mixture of

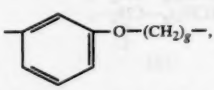


and

wherein $R_3$ and $R_4$ are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of $R_3$ and $R_4$ is fluoro only when the other is hydrogen or fluoro;
wherein $Z_2$ is
(1) —$(CH_2)_3$—$(CH_2)_g$—$CH_2$—,
(2) —$(CH_2)_3$—$(CH_2)_g$—$CF_2$—,
(3) —$CH_2$—O—$CH_2$—$(CH_2)_g$—$CH_2$—,
(4) —C≡C—$CH_2$—$(CH_2)_g$—$CH_2$—,
(5) —$CH_2$—C≡C—$(CH_2)_g$—$CH_2$—,

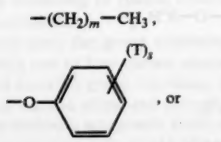


(6)



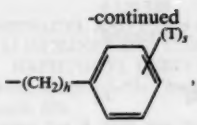
(7)

wherein g is 1, 2 or 3;
wherein $R_7$ is



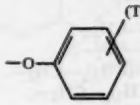
(1)
(2)

-continued



(3)

wherein m is 1 to 5, inclusive, h is 0 or 1, T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, and s is 0, 1, 2, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl, with the further proviso that $R_7$ is

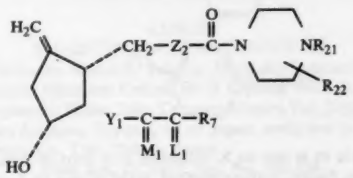


wherein T and s are as defined above, only when $R_3$ and $R_4$ are hydrogen or methyl, being the same or different; and
wherein $R_{21}$ and $R_{22}$ are hydrogen, alkyl of one to 12 carbon atoms, inclusive; aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 3 carbon atoms, inclusive, or phenyl substituted with hydroxycarbonyl or alkoxycarbonyl of one to 4 carbon atoms, inclusive.

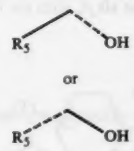
---

**4,129,726**
**9-DEOXY-9-METHYLENE-PGF$_1$-PIPERIZINYLAMIDES**
**Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.**
**Continuation-in-part of Ser. No. 786,250, Apr. 11, 1977, Pat. No. 4,098,805. This application Apr. 7, 1978, Ser. No. 894,270**
**Int. Cl.$^2$ C07C *177/00***
**U.S. Cl. 542—426** **32 Claims**

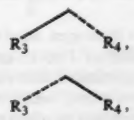
1. A prostaglandin analog of the formula



wherein $Y_1$ is trans—CH=CH—, —C≡C—, or —$CH_2$-$H_2$—wherein $M_1$ is



wherein $R_5$ is hydrogen or methyl;
wherein $L_1$ is



or a mixture of

-continued

and

wherein $R_3$ and $R_4$ are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of $R_3$ and $R_4$ is fluoro only when the other is hydrogen or fluoro;

wherein $Z_2$ is

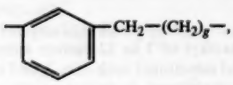
(1) $-(CH_2)_3-(CH_2)_g-CH_2-$,

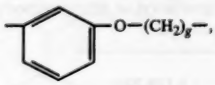
(2) $-(CH_2)_3-(CH_2)_g-CF_2-$,

(3) $-CH_2-O-CH_2-(CH_2)_g-CH_2-$,

(4) $-C\equiv C-CH_2-(CH_2)_g-CH_2-$,

(5) $-CH_2-C\equiv C-(CH_2)_g-CH_2-$,

(6) 

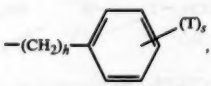
(7) 

wherein g is one, 2 or 3;

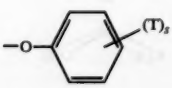
wherein $R_7$ is

(1) $-(CH_2)_m-CH_3$,

(2)

(3) 

wherein m is one to 5, inclusive, h is zero or one, T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, and s is zero, one, 2, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl, with the further proviso that $R_7$ is



wherein T and s are as defined above, only when $R_3$ and $R_4$ are hydrogen or methyl, being the same or different; and

wherein $R_{21}$ and $R_{22}$ are hydrogen, alkyl of one to 12 carbon atoms, inclusive; aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 3 carbon atoms, inclusive, or phenyl substituted with hydroxycarbonyl or alkoxycarbonyl of one to 4 carbon atoms, inclusive.

**4,129,727**

## 9-DEOXY-9-METHYLENE-PGF$_1$-PYRROLIDYLAMIDES

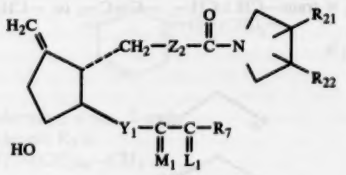
**Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.**

**Continuation-in-part of Ser. No. 786,250, Apr. 11, 1977, Pat. No. 4,098,805. This application Apr. 7, 1978, Ser. No. 894,273**

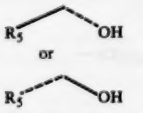
**Int. Cl.**[2] *C07C 177/00*

**U.S. Cl. 542—426** **32 Claims**

1. A prostaglandin analog of the formula

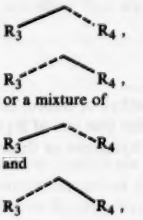


wherein $Y_1$ is trans—CH=CH—, —C|C—, or $-CH_2CH_2-$ wherein $M_1$ is



wherein $R_5$ is hydrogen or methyl;

wherein $L_1$ is



wherein $R_3$ and $R_4$ are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of $R_3$ and $R_4$ is fluoro only when the other is hydrogen or fluoro;

wherein $Z_2$ is

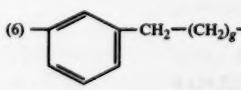
(1) $-(CH_2)_3-(CH_2)_g-CH_2-$,

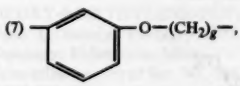
(2) $-(CH_2)_3-(CH_2)_g-CF_2-$,

(3) $-CH_2-O-CH_2-(CH_2)_g-CH_2-$,

(4) $-C|C-CH_2-(CH_2)_g-CH_2-$,

(5) $-CH_2-C|C-(CH_2)_g-CH_2-$,

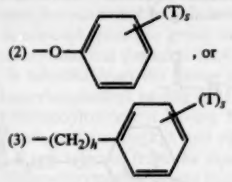
(6) 

(7) 

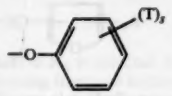
wherein g is 1, 2 or 3;

wherein $R_7$ is

(1) $-(CH_2)_m-CH_3$,



wherein m is 1 to 5, inclusive, h is 0 or 1, T is chloro, fluoro, trifluoromethyl, alkyl of 1 to 3 carbon atoms, inclusive, or alkoxy of 1 to 3 carbon atoms, inclusive, and s is 0, 1, 2, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl, with the further proviso that $R_7$ is



wherein T and s are as defined above, only when $R_3$ and $R_4$ are hydrogen or methyl, being the same or different; and wherein $R_{21}$ and $R_{22}$ are hydrogen, alkyl of 1 to 12 carbon atoms, inclusive: aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with 1, 2, or 3 chloro or alkyl of 1 to 3 carbon atoms, inclusive, or phenyl substituted with hydroxycarbonyl or alkoxycarbonyl of 1 to 4 carbon atoms, inclusive.

---

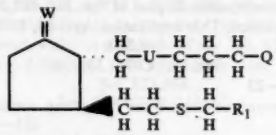
**4,129,728**

## 2-(DESCARBOXY)-2-(TETRAZOL-5-YL) 11-DESOXY-15-THIAPROSTAGLANDINS

**Jacob J. Plattner, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.**

**Division of Ser. No. 740,381, Nov. 10, 1976, Pat. No. 4,092,349. This application Jan. 11, 1978, Ser. No. 868,503**
**Int. Cl.[2] C07D *257/04***
**U.S. Cl. 542—429** **2 Claims**

1. An optically active compound of the formula



and the enantiomer and racemate thereof wherein:
Q is tetrazol-5-yl;
U is cis vinylene
W is

or oxygen;
$R_1$ is selected from the group consisting of phenyl and monosubstituted phenyl, said substituent being selected from the group consisting of fluoro, chloro, methyl, methoxy and trifluoromethyl;
$R_2$ is selected from the group consisting of hydrogen and alkyl having one to four carbon atoms;
$R_3$ is selected from the group consisting of alkyl having from one to four carbon atoms and phenyl;
or a pharmaceutically acceptable alkali metal, alkaline earth metal or ammonium salt of said compound.

---

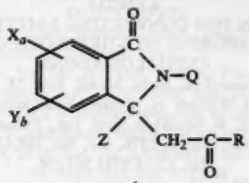
**4,129,729**

## 3-PHENACYL AND PHENACYLIDENE PHTHALIMIDINES AND CORRESPONDING NAPHTHOYL DERIVATIVES

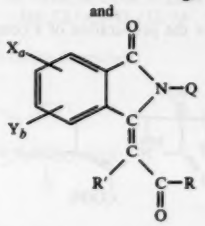
**John A. Houbion, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.**

**Filed Jan. 3, 1978, Ser. No. 867,721**
**Int. Cl.[2] A01N *9/22*; C07D *209/46***
**U.S. Cl. 542—439** **20 Claims**

1. A compound having a formula selected from



and



wherein R is phenyl, naphthyl, biphenylyl or substituted phenyl, there being from 1 to 5 substituents selected from alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen, nitro and trifluoromethyl, R' is hydrogen or bromine, X is halogen, Y is hydroxy, alkoxy of 1 to 4 carbon atoms, nitro or amino, a is 0 to 4, b is 0 to 2, the sum of a + b is 0 to 4, Q is hydrogen, alkyl of 1 to 3 carbon atoms, phenyl, halophenyl, nitrophenyl, trifluoromethylphenyl, tolyl, anisyl or tosylamino, and Z is hydrogen or OH.

---

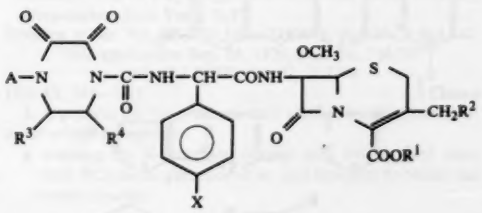
**4,129,730**

## 7α-METHOXY-CEPHALOSPORINS

**Isamu Saikawa; Shuntaro Takano; Hiroyuki Imaizumi; Isamu Takakura; Hirokazu Ochiai, all of Toyama; Takashi Yasuda, Kosugimachi; Hideo Taki, Toyama; Masaru Tai, Toyama, and Yutaka Kodama, Toyama, all of Japan, assignors to Toyama Chemical Co., Ltd., Tokyo, Japan**

**Filed Jan. 13, 1977, Ser. No. 759,134**
**Claims priority, application Japan, Jan. 22, 1976, 51-6117**
**Int. Cl.[2] C07D *501/34***
**U.S. Cl. 544—21** **6 Claims**

1. A 7 α-methoxy-cephalosporin represented by the formula:



wherein $R^1$ is a hydrogen atom, a protective group, or a pharmaceutically acceptable salt-forming cation; $R^2$ is an acetoxy, propionyloxy, butyryloxy, benzoyloxy, naphthoyloxy, cyclopentanecarbonyloxy, cyclohexanecarbonyloxy, furoyloxy, or thenoyloxy group which is unsubstituted or substituted by a

halogen atom, an alkyl group having 1 to 13 carbon atoms, or an alkyloxy or a hydroxyalkyl group each having 1 to 5 carbon atoms; $R^3$ and $R^4$ represent independently a hydrogen atom or a lower alkyl group; A is an alkyl group having 1 to 13 carbon atoms which is unsubstituted or substituted by a halogen atom, a hydroxyl group, or an alkyloxy or alkythio group each having 1 to 5 carbon atoms, and X is a hydrogen atom or a hydroxyl group.

---

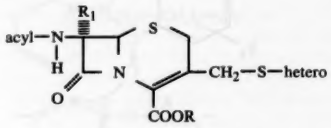
**4,129,731**

## PROCESS FOR CONVERTING 3-METHYLENE CEPHALOSPORINS TO 3-HETEROTHIOMETHYL CEPHALOSPORINS

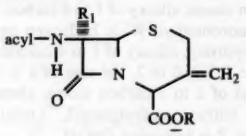
**William A. Slusarchyk, Belle Mead; Eric M. Gordon, West Trenton, and William H. Koster, Pennington, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.**

**Filed Dec. 8, 1976, Ser. No. 748,426**
**Int. Cl.[2] C07D *501/04***
**U.S. Cl. 544—21** **10 Claims**

1. A process for the preparation of a compound of the formula



which comprises reacting a 3-methylene compound of the formula



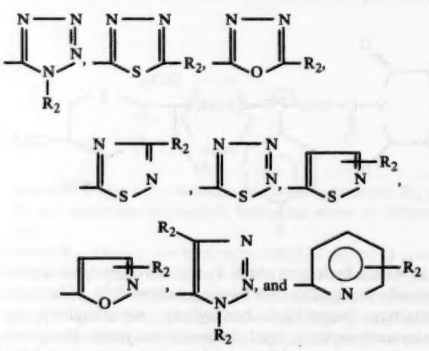
in an inert organic solvent with either a disulfide of the formula

hetero-S-S-hetero

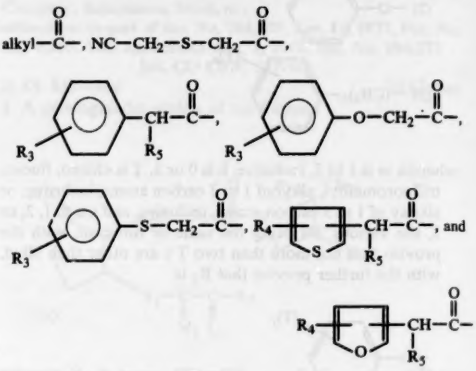
or a compound of the formula

X-S-hetero

in the presence of an alkali metal base or an organic base at a temperature of from about −80° C to about 20° C for from about 5 minutes to about 3 hours; wherein R is a readily removable ester group; $R_1$ is in the α-configuration and is hydrogen or methoxy; hetero is selected from the group consisting of



wherein $R_2$ is hydrogen or lower alkyl 1 to 4 carbons; acyl is selected from the group consisting of lower



wherein $R_3$ is hydrogen, Cl, Br, lower alkyl, or lower alkoxy, $R_4$ is hydrogen, Cl, Br, or lower alkyl, and $R_5$ is hydrogen, protected amino, or protected hydroxy; and X is halogen, lower alkoxycarbonylthio, phthalimido, succinimido, or

wherein Z is lower alkyl, phenyl, or phenyl having a methyl, methoxy, nitro, Br, or Cl substituent.

---

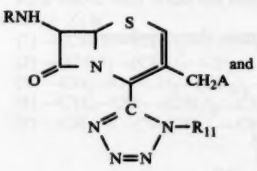
**4,129,732**

## 4(TETRAZOL-5-YL)-$\Delta^3$-CEPHEM COMPOUNDS

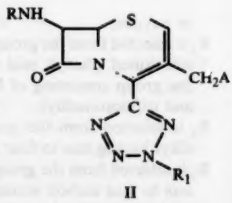
**Wayne E. Barth, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.**

**Division of Ser. No. 791,522, Apr. 27, 1977, which is a division of Ser. No. 658,303, Feb. 17, 1976, Pat. No. 4,045,436, which is a division of Ser. No. 508,634, Sep. 23, 1974, Pat. No. 3,966,719, which is a continuation-in-part of Ser. No. 407,097, Oct. 17, 1973, abandoned. This application Apr. 14, 1978, Ser. No. 896,322**
**Int. Cl.[2] C07D *501/16***
**U.S. Cl. 544—23** **6 Claims**

1. A compound selected from the group consisting of



I



II

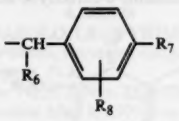
wherein R is selected from the group consisting of 2,2,2-tri-

chloroethoxycarbonyl, 2,2,2-tribromoethoxycarbonyl and benzyloxycarbonyl;

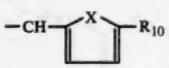
A is selected from the group consisting of 1-methyl-5-tetrazolylthio and 2-methyl-1,3,4-thiadiazolyl-5-thio;

$R_1$ is selected from the group consisting of hydrogen, alkanoyloxymethyl having from three to six carbon atoms, 1-(alkanoyloxy)ethyl having from four to seven carbon atoms, methoxymethyl, and phthalidyl;

and $R_{11}$ is selected from the group consisting of hydrogen, alkanoyloxymethyl having from three to six carbon atoms, 1-(alkanoyloxy)ethyl having from four to seven carbon atoms, methoxymethyl, phthalidyl,



wherein $R_6$ is selected from the group consisting of alkyl having from one to three carbon atoms and phenyl and $R_7$ is selected from the group consisting of hydroxy, methoxy, alkanoyloxy having two to four carbon atoms, and benzyloxy and $R_8$ is selected from the group consisting of hydrogen, hydroxy, fluoro, chloro, bromo, iodo, methyl, methoxy, alkanoyloxy having from two to four carbon atoms, phenyl and benzyloxy and



wherein $R_9$ and $R_{10}$ are each selected from the group consisting of hydrogen and methyl and X is selected from the group consisting of oxygen and sulfur.

---

**4,129,733**

## SUBSTITUTED PYRIDINE THIONOCARBONYL HALIDES AND DERIVATIVES

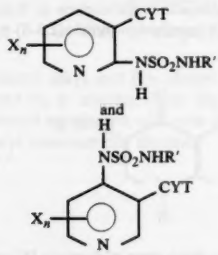
**Lennon H. McKendry, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.**

**Division of Ser. No. 747,671, Dec. 6, 1976, which is a division of Ser. No. 676,591, Apr. 13, 1976, Pat. No. 4,014,888, which is a continuation-in-part of Ser. No. 572,024, Apr. 28, 1975, abandoned, which is a division of Ser. No. 412,944, Nov. 5, 1973, Pat. No. 3,920,641. This application Jan. 23, 1978, Ser. No. 871,566**

**Int. Cl.[2] C07D *213/54***

**U.S. Cl. 544—131** **1 Claim**

1. A compound of the formulae:



III

and

IV

wherein:

each X independently represents loweralkyl of 1 to 6 carbon atoms, halologeralkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, $SR^5$, $OR^5$, aryl wherein aryl is phenyl, halophenyl or tolyl, $—NR^3R^4$, halo or nitro;

n represents an integer of 0 to 3, inclusive;

Y represents sulfur;

T represents halo;

R' represents pyrrolidinoethyl, piperidinoethyl or morpholinoethyl

each of $R^3$ and $R^4$ independently represents hydrogen or loweralkyl of 1 to 6 carbon atoms;

$R^5$ represents loweralkyl of 1 to 6 carbon atoms.

---

**4,129,734**

## SUBSTITUTED PYRIDINE CARBONYL HALIDES AND DERIVATIVES

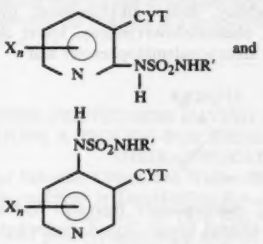
**Lennon H. McKendry, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.**

**Division of Ser. No. 747,267, Dec. 3, 1976, Pat. No. 4,085,279, which is a division of Ser. No. 676,591, Apr. 13, 1976, Pat. No. 4,014,888, which is a continuation-in-part of Ser. No. 572,024, Apr. 28, 1975, abandoned, which is a division of Ser. No. 412,944, Nov. 5, 1973, Pat. No. 3,920,641. This application Jan. 23, 1978, Ser. No. 871,568**

**Int. Cl.[2] C07D *213/54***

**U.S. Cl. 544—131** **1 Claim**

1. A compound of the formulae:



III

and

IV

wherein:

each X independently represents loweralkyl of 1 to 6 carbon atoms, halologeralkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, $SR^5$, $OR^5$, aryl wherein aryl is phenyl, halophenyl or tolyl, $—NR^3R^4$, halo or nitro;

n represents an integer of 0 to 3, inclusive;

Y represents oxygen;

T represents halo;

R' represents pyrrolidinoethyl, piperidinoethyl or morpholinoethyl;

each of $R^3$ and $R^4$ independently represents hydrogen or loweralkyl of 1 to 6 carbon atoms;

$R^5$ represents loweralkyl of 1 to 6 carbon atoms.

---

**4,129,735**

## PROCESS FOR PREPARING TETRAZOLE-5-CARBOXAMIDE DERIVATIVES

**John H. Sellstedt, Pottstown, and Dieter H. Klaubert, West Chester, both of Pa., assignors to American Home Products Corporation, New York, N.Y.**

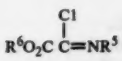
**Division of Ser. No. 669,570, Mar. 23, 1976, Pat. No. 4,013,647. This application Sep. 24, 1976, Ser. No. 726,707**

**Int. Cl.[2] C07D *413/02, 257/04***

**U.S. Cl. 544—132** **2 Claims**

1. A process for the production of a 1H-tetrazole-5-carboxamide which comprises

a. reacting an N-protected oxamic acid lower alkyl ester with $PCl_5$ in the presence of an acid acceptor to obtain the imidochloride



in which $R^6$ is lower alkyl and $R^5$ is a member selected from the group consisting of benzyl, 4-methoxybenzyl

2,4-dimethoxybenzyl, 2,6-dimethoxybenzyl, 2,4,6-trimethoxybenzyl and trichloroethyl;

b. cyclizing said imido-chloride with hydrazoic acid to produce the ester 1-$R^5$-5-carbo(lower)alkoxy-1H-tetrazole;

c. saponifying said ester to obtain an alkali metal salt of said tetrazole;

d. converting said tetrazole salt to the 5-chlorocarbonyl-1-$R^5$-1H-tetrazole by reaction with a chlorinating agent;

e. reacting said 5-chlorocarbonyl-1-$R^5$-1H-tetrazole with an aromatic amine of the formula $ANH_2$;

f. removing the 1-$R^5$ group from the product of step (e); wherein

A is a member selected from the group consisting of 2-thiazolyl, 2-pyridyl, 6-(lower)alkyl-2-pyridyl, 3-cyano-2-pyridyl, 3-pyridyl, 4-pyridyl, 2-pyrimidinyl, 2-pyrazinyl, α-naphthyl, β-naphthyl, phenyl, 2,6-dichlorophenyl, and substituted phenyl moieties having from one to three substituents in any of the 2,3,4 and 5 positions of the phenyl ring, independently selected from the group consisting of lower alky', lower alkylsulfinyl, lower alkoxy, hydroxy(lower)alkoxy, 2-(lower alkoxy oxalyloxy)ethoxy, N-mono- and di-lower alkyl amino (lower)alkoxy, halo, sulfamyl, polyhalo(lower)alkyl, carbamyl, N-lower alkylcarbamyl, carboxy, lower alkylcarbonyl, cyano, carb(lower)alkoxy, phenoxy(lower)alkoxy, lower alkoxyoxalamido, lower alkoxyoxalamidophenoxy and

where $R^8$ and $R^7$, independently represent hydrogen, lower alkyl, lower alkenyl, lower alkynyl, cycloalkyl of 5 or 6 carbon atoms, aralkyl of 7 to 9 carbon atoms, aryl of 6 to 10 carbon atoms or, $R^8$ and $R^7$, taken together with the nitrogen atom to which they are attached form a heterocyclic group selected from aziridinyl, azetidinyl, pyrrolidinyl, piperidino, piperazinyl, 4-lower alkylpiperazinyl, morpholino thio morpholino and a ring substituted lower alkyl analogue of said heterocyclic group.

---

**4,129,736**

## TRIAZINYL-ANTRAQUINONE DYESTUFFS

**Rainer Begrich, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.**

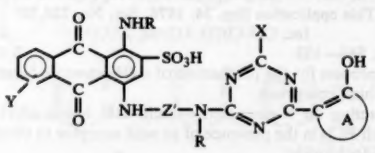
**Division of Ser. No. 567,796, Apr. 14, 1975, Pat. No. 4,033,944. This application Jan. 27, 1977, Ser. No. 763,196**

**Claims priority, application Switzerland, Apr. 18, 1974, 5359/74**

**Int. Cl.[2] C07D 251/16**

**U.S. Cl. 544—189** **2 Claims**

1. A fiber-reactive anthraquinone dyestuff of the formula



wherein

Y is hydrogen or sulfo,

$Z^1$ is a phenylene or diphenylene divalent linking radical;

X is chloro, bromo or fluoro;

R is hydrogen, lower alkyl, cyclohexyl or phenyl; and

the ring A is cyclopentenyl, cyclohexenyl or cycloheptenyl.

**4,129,737**

## PROCESS FOR THE PREPARATION OF AN 8-ALKYL-5-OXO-5,8-DIHYDRO-PYRIDO(2,3-D)PYRIMIDINE-6-CARBOXYLIC ACID

**Marcel Pesson, Paris, France, assignor to Laboratoire Roger Bellon, Neuilly-sur-Siene, France**

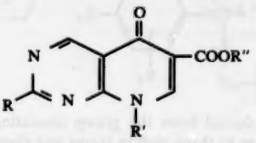
**Division of Ser. No. 625,779, Oct. 24, 1975, which is a division of Ser. No. 384,203, Jul. 31, 1973, Pat. No. 3,950,338. This application Aug. 17, 1976, Ser. No. 715,191**

**Claims priority, application France, Aug. 2, 1972, 72.27876**

**Int. Cl.[2] C07D 471/04**

**U.S. Cl. 544—279** **3 Claims**

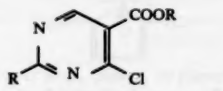
1. Process for the preparation of an 8-alkyl-5-oxo-5,8-dihydro-pyrido(2,3-d)pyrimidine-6-carboxylic acid of the formula:



(I)

in which R is hydrogen, lower alkyl, lower alkoxy, lower alkylmercapto, or chloro and R' and R" are lower alkyl, which comprises:

(a) condensing a 4-chloro-5-carbalkoxy-pyrimidine of formula:

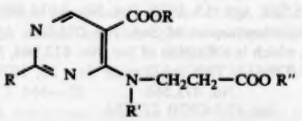


(II)

with a lower alkyl β-amino-propionate of formula:

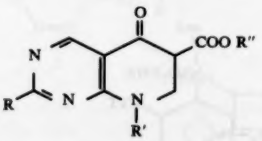
$$R' - NH - CH_2 - CH_2 - COO\ R''$$

at about room temperature in a neutral solvent and in the presence of an acceptor of HCl formed during condensation to form a 4-N-(β-carbalkoxyethylamino)-5-carbalkoxy pyrimidine of formula:



(III)

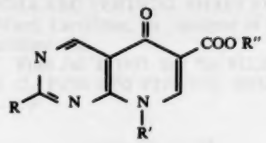
(b) cyclising the compound of formula III by reaction with an alkaline alcoholate at about room temperature in the presence of an aromatic hydrocarbon to form a 5-oxo-6-carbalkoxy-5,6,7,8-tetrahydro-pyrido(2,3-d)-pyrimidine of formula:



(IV)

(c) halogenating the -keto-ester of formula IV with an agent selected from bromine and sulphurylchloride to yield the corresponding 6-halogeno-derivative,

(d) treating the said derivative with a base selected from aliphatic, aromatic to bring about dehydrohalogenation to give a 6-carbalkoxy-5-oxo-5,8-dihydro-pyrido(2,3-d) pyrimidine of formula:



(VI)

---

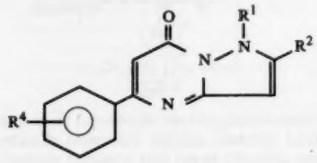
4,129,738

## 5-PHENYLPYRAZOLO[1,5-a]PYRIMIDIN-7(1H)-ONES

Hans Hoehn, Tegernheim, Germany, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 741,572, Nov. 15, 1976, Pat. No. 4,048,184. This application May 9, 1977, Ser. No. 794,852
Int. Cl.[2] C07D *487/04*
U.S. Cl. 544—281 13 Claims

1. A compound of the formula



wherein $R^1$ is lower alkyl, phenyl, phenyl-lower alkyl or cyclo-lower alkyl having 4 to 7 carbon atoms;

$R^2$ is hydrogen, lower alkyl or phenyl;

and $R^4$ is hydrogen, halogen, hydroxy, lower alkoxy or amino.

---

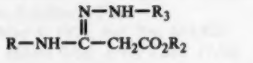
4,129,739

## AMIDINE COMPOUNDS

David J. Tracy, Lincoln Park, N.J., and Walter F. Hoffstadt, Vestal, N.Y., assignors to GAF Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 603,533, Aug. 11, 1975, abandoned. This application Nov. 15, 1976, Ser. No. 742,054
Int. Cl.[2] C07C *79/46*
U.S. Cl. 560—21 11 Claims

1. Amidines of the general formula:



where $R_2$ is lower alkyl, and R is phenyl substituted with halo and nitro, and $R_3$ is selected from the group consisting of phenyl or phenyl substituted with one or more of halo, nitro and alkoxy and combinations thereof.

4,129,740

## PROCESS FOR THE PREPARATION OF PARA-NITROSO-DIPHENYLHYDROXYLAMINES

Hans Zengel, Kleinwallstadt, and Manfred Bergfeld, Erlenbach, both of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed Jan. 30, 1978, Ser. No. 873,327
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1977, 2703919
Int. Cl.[2] C07C *79/46, 85/24, 101/72*
U.S. Cl. 560—48 8 Claims

1. In a process for the preparation of para-nitrosodiphenylhydroxylamines wherein one member selected from the group consisting of nitrosobenzene, ortho-substituted nitrosobenzenes, meta-substituted nitrosobenzenes, ortho-meta-disubstituted nitrosobenzenes, and para-substituted nitrosobenzenes, is reacted with one member selected from the group consisting of nitrosobenzenes, ortho-substituted nitrosobenzenes, meta-substituted nitrosobenzenes, and ortho-meta-disubstituted nitrosobenzenes in the presence of an acid catalyst, the improvement comprising utilizing as the acid catalyst an acid selected from the group consisting of aliphatic, cycloaliphatic, and aromatic sulfonic acids, having a $pK_a$ equal to or less than 1, perchloric acid, and trifluoroacetic acid, in an amount equal to or greater than 0.5 mol of acid per mol of nitroso reactants, and performing the reaction at a temperature from about −20° C. to 60° C.

---

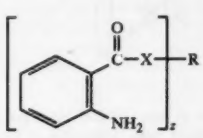
4,129,741

## NOVEL POLYETHERS HAVING TERMINAL AMINO GROUPS, A PROCESS FOR THEIR PRODUCTION AND THEIR APPLICATION

Oskar Schmidt, Kittsee, and Walter Sibral, Tulln, both of Austria, assignors to Lim-Holding, S.A., Luxembourg

Filed Oct. 26, 1976, Ser. No. 735,291
Claims priority, application Austria, Oct. 27, 1975, 8155/75; Oct. 27, 1975, 8156/75
Int. Cl.[2] C07C *101/54;* C08G *18/02*
U.S. Cl. 560—50 20 Claims

1. Novel compounds having terminal amino groups, said novel compounds being of the general formula



(I)

wherein z is an integer of 2 to 4, X is oxygen or sulfur and R is a group of the formula

$$-Y-[Ar-B]_k \qquad \text{(II)}$$

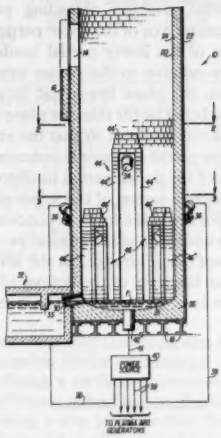
wherein k stands for an integer of 1 to 4, Ar is an aromatic group, Y when k = 1 is B and when k = 2 to 4 is an alkylidene group having 1 to 5 carbon atoms and B represents a divalent polyalkylene ether group or polyalkylene thioether group such as it is obtained by removal of the hydroxyl or mercapto groups from a polyalkylene ether diol or a polyalkylene thioether dithiol of a molecular weight of about 100 to 15000.

4,129,742

## PLASMA ARC VERTICAL SHAFT FURNACE

George C. Ward, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Filed Jul. 1, 1977, Ser. No. 812,291
Int. Cl.[2] F27D *3/00*; F27B *9/00*; H05H *1/00*
U.S. Cl. 13—2 P 10 Claims



1. A vertical shaft furnace for melting metal materials comprising a vertically elongated melting chamber having upper and lower chamber portions, said upper chamber portion having means for gravity-charging metal into said melting chamber during operation of said furnace and forming thereby a continuously descending metal column during said operation, said lower chamber portion having an interior wall formed of a refractory material and a floor, said floor including means for collecting a pool of molten metal melted in said furnace, outlet means in said lower chamber portion communicating with said molten metal collecting means for continuously withdrawing molten metal therefrom, a plurality of downwardly-inclined openings arranged in two vertically spaced planes and in spaced relation about the lower chamber portion, plasma arc torches arranged in said openings, means for connecting an electrical power source between said torches and said metal charge and means connected to said torches for extending and retracting said torches relative to said lower chamber portion into operating positions thereof.

---

4,129,743

## TERMINAL BOX FOR UNDERGROUND ELECTRICAL CONDUCTORS

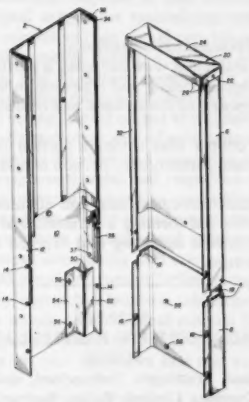
Gerald A. Lohsl, Somerville, N.J., assignor to Telephone Utility Terminal Co., Inc., Leesburg, Fla.

Filed May 6, 1976, Ser. No. 683,859
Int. Cl.[2] H02G *9/00, 3/14*; C23F *13/00*
U.S. Cl. 174—38 9 Claims

2. A terminal box for use in connection with underground electrical conductors, said terminal box comprising an upstanding housing having an upper exposed portion and a lower buried portion, said upper exposed portion being provided with an above-ground cover which is movable to provide access to the interior of said housing, means in said housing for supporting electrical conductors, an opening in said housing for the entry of underground electrical conductors, said terminal box having passage-forming means in said lower portion providing a vertical passage for guiding the entrance of underground electrical conductors into the housing, said passage-forming means including a first portion for lying against an interior wall of said housing, and a second portion which is spaced from the interior walls of the buried portion of the housing to form said passage, means for detachably connecting the first portion of the passage-forming means to the lower portion of the housing, and additional means in the housing for detachably connecting the passage-forming means at different locations within the lower portion.

4. A terminal box for use in connection with underground electrical conductors, said terminal box comprising an upstanding housing having an upper exposed portion and a lower buried portion, said upper exposed portion being provided with an above-ground cover which is movable to provide access to the interior of said housing, means in said housing for supporting electrical conductors, an opening in said housing for the entry of underground electrical conductors, said housing being formed of a front channel member and a rear channel member, said front channel member having a front panel and rearwardly extending side flanges, said rear channel member having a rear panel and forwardly extending side flanges, said side flanges of said channel members having vertical marginal portions, means for connecting the vertical marginal portions of said front channel member with vertical marginal portions of said rear channel member,

a first sheet of dielectric material overlying and connected to the interior face of said front channel member, a second sheet of dielectric material overlying and connected to the interior face of said rear channel members, said sheets including marginal vertical edge portions which overlie each other to provide electrical insulation throughout the horizontal extent of the housing.



5. A terminal box for use in connection with underground electrical conductors, said terminal box comprising an upstanding housing having an upper exposed portion and a lower buried portion, said upper exposed portion being provided with an above-ground cover which is movable to provide access to the interior of said housing, means in said housing for supporting electrical conductors, an opening in said housing for the entry of underground electrical conductors, said housing being formed of a front channel member and a rear channel member, said front channel member having a front panel and rearwardly extending side flanges, said rear channel member having a rear panel and forwardly extending side flanges, said side flanges of said channel members having vertical marginal portions, means for connecting the vertical marginal portions of said front channel member with vertical marginal portions of said rear channel member to hold the channel members at a predetermined position with respect to each other,

said vertical marginal portions of said front channel member having a confronting surface which overlaps and lies against a corresponding confronting surface of the vertical marginal portions of said rear channel member, resilient strip means connected to one of said channel members at a location adjacent to a said confronting surface, said resilient strip means being sealingly biased against the opposed channel member at a location on its surface which lies opposite to its said confronting surface,

said resilient strip means contacting the opposed channel member in an area spaced from the edge of the opposed channel member when said channel members are at a said predetermined position with respect to each other, said resilient strip means having a lip portion outturned from the confronting surface of its respective channel member.

---

**4,129,744**

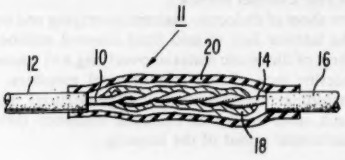
## SOLDER CONNECTION BETWEEN COPPER AND ALUMINUM CONDUCTORS

**Thomas J. Cunningham, Philadelphia, Pa.; Harold L. Schwartzberg, deceased, late of Holland, Pa., and Joseph L. McGlynn, Jr., executor, Philadelphia, Pa., assignors to RCA Corporation, New York, N.Y.**

**Filed Aug. 2, 1976, Ser. No. 710,744**

**Int. Cl.² H01R *5/04***

**U.S. Cl. 174—94 R** **9 Claims**




1. A solder connection comprising:

a strand of aluminum wire including a portion partially clad with a copper coating and a portion in which the aluminum is exposed to the ambient and coated with aluminum oxide,

a strand of copper wire having a portion disposed contiguous with said partially clad portion of said aluminum wire, and

lead-tin solder interconnecting said aluminum wire to said copper wire and forming a hermetic seal about said contiguous portions including said exposed aluminum oxide coated portion.

---

**4,129,745**

## LARGE INSULATOR WITH PARTICULAR CEMENTED JOINT

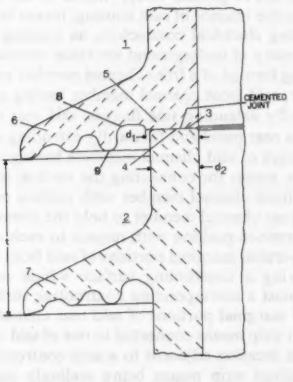
**Fritz Korischum, Wettingen, Switzerland, assignor to Brown, Boveri & Company Limited, Baden, Switzerland**

**Filed Mar. 3, 1977, Ser. No. 774,117**

**Claims priority, application Switzerland, Mar. 12, 1976, 003081/76; Dec. 20, 1976, 015981/76**

**Int. Cl.² H01B *17/66***

**U.S. Cl. 174—209** **5 Claims**




1. A large insulator comprising:

at least two ceramic partial insulators, each provided with at least one annular protective screen, one of the partial insulators having a center axis and having a plane face at a lower end thereof, another partial insulator having a center axis and having a plane face at an upper end thereof, said two partial insulators being arranged one above the other with said plane faces being cemented together to form a cemented joint, the lower end face of the upper partial insulator extending perpendicularly relative to the center axis of the upper partial insulator, the upper end face of the lower partial insulator extending perpendicularly relative to the center axis of the lower partial insulator, the plane lower end face of the upper partial insulator being larger than the plane upper end face of the lower partial insulator so that the entire plane end face of the lower partial insulator is cemented to the lower plane end face of the upper partial insulator,

said annular protective screen of the upper partial insulator having a base portion and a series of concentric ridges and grooves on the underside of the annular protective screen,

said cemented joint being arranged at the level of said base portion between the level of the bottom of the innermost groove and the level of the top of the innermost ridge.

---

**4,129,746**

## ELECTROGRAPHIC APPARATUS AND HAND REST FOR USE THEREWITH

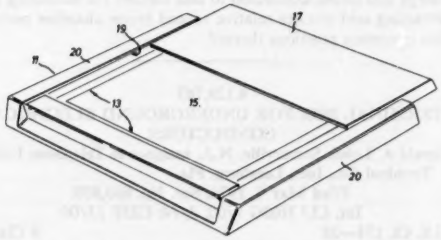
**Martin R. Lambden, Wimborne, England, assignor to Quest Automation Limited, Dorset, England**

**Division of Ser. No. 710,083, Jul. 30, 1976, Pat. No. 4,070,544. This application May 2, 1977, Ser. No. 792,829**

**Claims priority, application United Kingdom, Aug. 5, 1975, 32687/75**

**Int. Cl.² G08C *21/00***

**U.S. Cl. 178—18** **4 Claims**




1. Electrographic apparatus comprising:

(a) a pressure sensitive surface which, in use of the apparatus, responds to pressure applied by a writing instrument to provide electrical output signals related to the location of the instrument;

(b) a hand-supporting member upon which the hand may conveniently be rested during writing on said pressure sensitive surface;

(c) a housing having a window formed in a wall thereof, said pressure sensitive surface being mounted within said housing so as to be exposed through said window, and

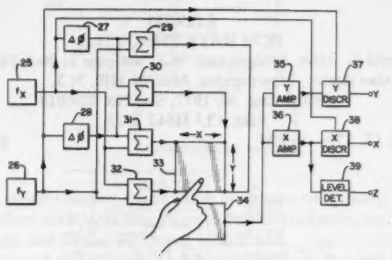
(d) bearing means on said housing, said bearing means supporting said hand-supporting member on said housing and arranged to permit movement of the said member across said window.

## 4,129,747

## HUMAN-MACHINE INTERFACE APPARATUS

William Pepper, Jr., Bethesda, Md., assignor to Peptek, Inc., Bethesda, Md.

Continuation of Ser. No. 717,192, Aug. 24, 1976, Pat. No. 4,071,691. This application Nov. 11, 1977, Ser. No. 850,741
The portion of the term of this patent subsequent to Jan. 31, 1995, has been disclaimed.
Int. Cl.[2] G08C 21/00
U.S. Cl. 178—19 2 Claims




1. A human-machine interface apparatus for inputting information to a utilization device comprising:

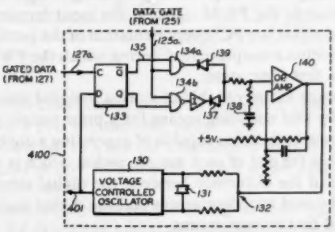
means for defining a surface of predetermined length and having a reference point thereon; field-establishing means for establishing a low level electric field above said surface and along said predetermined length and into which a human finger can be inserted to touch a selected point on said surface and traverse a path therealong, said electric field having a parameter that varies continuously along said predetermined length as a function of distance from said reference point; detector means for detecting the position of said touched point on said surface and the path traversed thereby with respect to said reference point and producing an electrical signal corresponding thereto as an input signal to said utilization device, said detector means including a signal level detector for detecting the presence or absence of at least a portion of the operator's body in a predetermined position.

## 4,129,748

## PHASE LOCKED LOOP FOR PROVIDING CONTINUOUS CLOCK PHASE CORRECTION

Richard Saylor, Monsey, N.Y., assignor to IDR, Inc., Farmingdale, N.Y.

Continuation-in-part of Ser. No. 611,843, Sep. 10, 1975, Pat. No. 4,042,958. This application Apr. 23, 1976, Ser. No. 679,701
Int. Cl.[2] H04L 7/00
U.S. Cl. 178—69.1 20 Claims



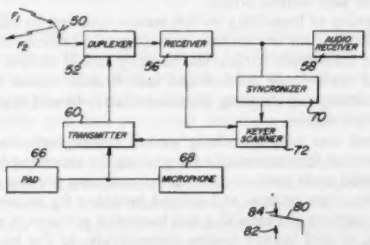

1. A phase locked loop apparatus for providing a continuous output digital clock signal having first and second states which is continuously phase locked to a reference digital data signal, said digital data signal comprising at least one data transition, said apparatus comprising variable voltage controlled oscillator means having a predetermined variable nominal frequency, said voltage controlled oscillator means having an input and an output and providing said output digital clock signal at said output thereof; bistable phase detection means having a pair of inputs for varying the state of said bistable phase detection means between a first and second state, said bistable means having a first control signal output in said first state thereof and a second control signal output in a second state thereof, one input of said bistable means being connected in parallel to said voltage controlled oscillator means output for detecting said clock signal output, the other input of said bistable means being connected to substantially simultaneously detect said reference digital data signal, said bistable phase detection means being responsive to said state of said clock signal and the occurrence of said at least one data transition in said substantially simultaneously detected digital data signal for varying said bistable means state, said bistable means being in said first state in response to the substantially simultaneous detection of said clock signal first state and said digital data transition and in said second state in response to the substantially simultaneous detection of said clock signal second state and said digital data transition for providing a change in said bistable means control signal output only when the phasing of said clock signal changes with respect to the phasing of said data signal, said first bistable means output control signal being indicative of a phase lead condition between said clock signal and said data signal and said second bistable means output control signal being indicative of a phase lag condition between said clock signal and said data signal, and means operatively connected between said bistable means first and second control signal outputs and said oscillator means input for providing a control voltage signal to said oscillator means input to vary said nominal frequency thereof in response to said bistable means provided control signal output for maintaining said continuous phase lock, said control voltage signal providing means comprising a capacitive means having a variable voltage signal output therefrom, said capactive means being responsive to one of said control signal outputs for charging to increase said capacitive means voltage signal output in response thereto and being responsive to said other one of said control signal outputs for discharging to decrease said capacitive means voltage signal output in response thereto, said respective charging and discharging of said capacitive means to vary said voltage signal output thereof occurring as long as said phase condition associated with said respective control signal output remains, said voltage signal output comprising said control voltage signal, said control signal providing means further comprising diode means operatively connected between said capacitive means and said bistable means control signal outputs for providing respective charge and discharge paths for said capacitive means in response to said respective first and second control signal outputs.

## 4,129,749

## RADIO TELEPHONE COMMUNICATIONS SYSTEM

Stephen R. Goldman, 7435 Ruskin Rd., Philadelphia, Pa. 19151

Continuation-in-part of Ser. No. 699,450, Jun. 24, 1976, abandoned. This application Dec. 13, 1976, Ser. No. 750,175
Int. Cl.[2] H04Q 7/04
U.S. Cl. 179—2 EB 14 Claims




1. In a two frequency time division multiplexed radio telephone system that includes a base station that transmits information on one of said frequencies and receives information on the other of said frequencies, and plurality of portable units that receive information on said one frequency and transmit information on the other of said frequencies and both of said frequencies are divided into a plurality of channels and each of said portable units includes a means for detecting a calling

signal which has been assigned to it, the improvement comprising,

each of said portable units including means for indicating that it is being called by the base station, said indicating means including an alarm means for alerting the operator of said portable unit that it is being called, said alarm means including a switch which is normally in a first position and a gate, said switch being operative to normally apply a first predetermined signal to said gate, means for applying a second predetermined signal to said gate when said portable unit detects that it is being called, said alarm means further including an energizable alarm and a ring timer, and said alarm is energized for a predetermined number of intervals by said ring timer when both of said signals are applied to said gate at the same time, and said alarm is deenergized when said switch is moved to a second position.

---

**4,129,750**

## DIGITAL TIME DIVISION MULTIPLEX TELECOMMUNICATION NETWORK

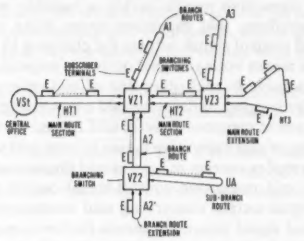
**Alfred Mattern, Gröbenzell, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany**

**Filed Apr. 4, 1977, Ser. No. 784,452**

**Claims priority, application Fed. Rep. of Germany, May 6, 1976, 2620058**

**Int. Cl.[2] H04J *3/08***

**U.S. Cl. 179—15 AL** **3 Claims**




1. In a digital time division multiplex (TDM) telecommunication network having a plurality of subscriber terminals connected in a predetermined sequence to a common TDM highway, said TDM highway beginning and ending in a central office thereby forming a loop, each TDM time frame containing information for each said subscriber terminal, said information being arranged in said time frame in a time sequence corresponding to the sequence of connection of said subscriber terminals to said TDM highway, the improvement comprising:

said TDM highway being arranged in at least one main route section and a plurality of branch routes, said main route section and said branch routes carrying information to and from said central office;

a plurality of branching switch means actuated by said central office for sequentially coupling said branch routes to said main route section and thereby to said central office, said main route section and said branch routes having incoming and outgoing portions relative to said branching switch means;

at least one said branching switch means including first switches for sequentially connecting the incoming portion of said main route section to the outgoing portion of said main route section and second switches for sequentially connecting the outgoing and incoming portions of at least one of said branch routes, respectively, to the incoming and outgoing portions of said main route section;

at least another one of said branching switch means connected to said main route section by one of said branch routes, said another one of said branching switch means including first switches for sequentially connecting the incoming portion of said one branch route to the outgoing portion of said one branch route and second switches for sequentially connecting the outgoing and incoming portions of at least another one of said branch routes, respectively, to the incoming and outgoing portions of said one branch route; and

storage means connected in the incoming portions of each of said branch routes for temporarily storing information returning to said central office to thereby prevent overlapping between time frames.

---

**4,129,751**

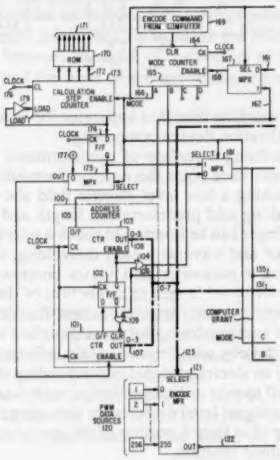
## PCM DATA THROTTLE

**Harold G. Alles, Bridgewater, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Aug. 30, 1977, Ser. No. 829,010**

**Int. Cl.[2] H04J *3/18***

**U.S. Cl. 179—15 BW** **9 Claims**




1. An arrangement for converting a pulse width modulated (PWM) signal to a pulse code modulated (PCM) signal, the arrangement comprising:

an input terminal capable of receiving a PWM signal;

an output terminal capable of connection to an external device for utilizing the generated PCM signal; and

converting means connected between the input and output terminals comprising;

an encoding means capable of generating a digital signal in response to the PWM signal at the input terminal which digital signal is a PCM representation of the portion of the time within a sample period during which the PWM signal is in a first logic state;

first storage means capable of storing a digital signal generated by said encoding means for a prior sample period;

first comparison means capable of generating a digital output signal at the end of each sample period which is representative of the difference between the digital signal generated by said encoding means and the digital signal stored in said first storage means;

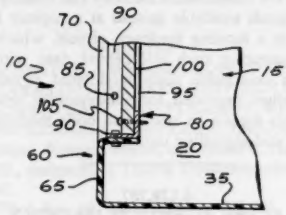
second storage means capable of storing a digital signal corresponding to a predetermined data threshold value representative of a significant value change; and

second comparison means capable of both comparing the digital output signal from said first comparison means with the predetermined data threshold value in the second storage means, and generating an output signal capable of causing the digital signal generated by said encoding means to be both stored in said first storage means and applied to the output terminal of the arrangement.

## 4,129,752
## SHOCK RESISTANT LOUDSPEAKER ENCLOSURE

Timothy L. Griffin, Jr., Shutesbury, Mass., assignor to Amanita Sound, Inc., Easthampton, Mass.

Filed Oct. 20, 1977, Ser. No. 843,836
Int. Cl.[2] H04R 1/02
U.S. Cl. 179—146 E 7 Claims



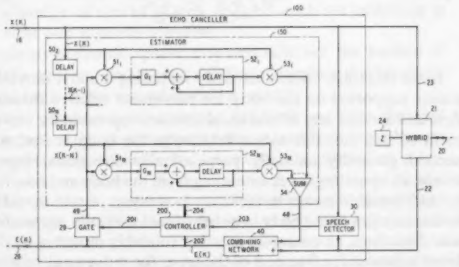

1. A shock resistant loudspeaker enclosure comprising:
a resilient shell including a sidewall structure having an open front and further including a back wall,
a resilient bracket integral with said shell and disposed relative thereto about the periphery of said open front said bracket comprising a shoulder extending inwardly from said sidewall structure and a mounting flange extending perpendicular to said shoulder from an inner edge thereof,
a rigid frame secured to said bracket and
a loudspeaker mounting baffle secured to said rigid frame and enclosing said opening.

---

## 4,129,753
## ECHO CANCELLER USING FEEDBACK TO IMPROVE SPEECH DETECTOR PERFORMANCE

Donald L. Duttweiler, Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 9, 1977, Ser. No. 859,245
Int. Cl.[2] H04B 3/20
U.S. Cl. 179—170.2 7 Claims



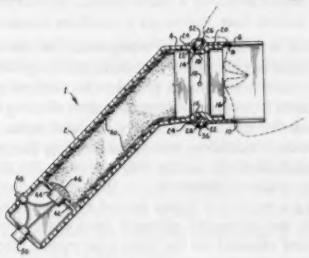

1. An echo canceller including an adjustable signal processor coupled to a first transmission path;
means coupled to a second transmission path for combining a signal in said second path with a signal extended from said processor;
said combining means for providing an error signal;
means for extending said error signal to said processor;
said processor including
means responsive to said error signal for adjusting said processor extended signal, said processor extended signal being an estimate of said second path signal; and
detector means responsive to signals in said first and said second paths for providing a detection status signal and CHARACTERIZED IN THAT said echo canceller further comprises:
controller means responsive to said detection status signal, a first path signal, and said error signal for extending a control signal to said error signal extending means for controlling the adjusting of said signal processor;
said control signal including a first state responsive to which said processor inhibits adjusting said estimate;
said first inhibiting state being extendable upon detection of the value of a first function of said error signal exceeding the value of a second function of said error signal.

---

## 4,129,754
## REPORTING DEVICE

Thomas A. Gore, Edina, Mo. 63537

Filed Jul. 1, 1977, Ser. No. 812,138
Int. Cl.[2] H04R 1/08
U.S. Cl. 179—188 17 Claims

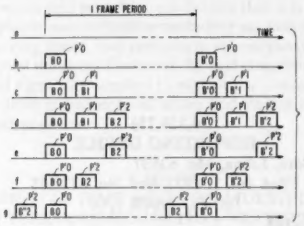


1. A reporting device comprising:
(a) an elongated housing having a closed end and an open end;
(b) a hollow face piece having two open ends and being adapted for mounting with one of said open ends positioned over said open end of said housing and in contact with said housing adjacent said open end of said housing and with the other open end thereof having means for achieving a relatively airtight contact when placed against the facial area around the mouth of the user of said device;
(c) transducer means positioned within said housing for generating an electrical signal in response to audio waves within said device;
(d) means for permitting pressurized air within said device to escape to the outside of said device when said other open end of said face piece is pressed against the facial area around the mouth of the device user and the device is in use;
(e) said means for permitting pressurized air within said device to escape to the outside further comprises a groove circumscribing said housing with at least one orifice through said housing in said groove, a channel formed within said face piece and inscribing said face piece, at least one aperture through the material of said face piece, said aperture connecting the interior of said piece with the exterior thereof with at least one aperture being located in said channel, said channel being positioned in said groove when said face piece is positioned on said housing;
whereby pressurized air within said device escapes to the exterior thereof by moving from the interior of said device through said orifice to said groove and thus into said channel in said face piece and thence through said aperture in said face piece to the exterior of said device thus enabling said transducer to generate relatively distortion free signals responsive to the user's voice.

## 4,129,755
## FRAME SYNCHRONIZING SYSTEM FOR TDMA RADIO COMMUNICATIONS

**Shuji Murakami, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan**

**Filed Nov. 7, 1977, Ser. No. 849,363**
**Claims priority, application Japan, Nov. 11, 1976, 51-136050**
**Int. Cl.² H04J 3/06**
**U.S. Cl. 179—15 BS** **4 Claims**

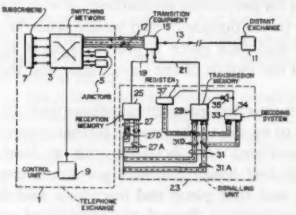



2. A frame synchronizing equipment for use in a time-division multiple-access radio communication system having plural radio channels between plural radio stations and separating the channels from one another on a time-sharing basis comprising: means for monitoring every channel upon initiation of a call for communication and for detecting the presence of an unoccupied channel; means responsive to the detection of an occupied channel followed by the unoccupied channel for extracting a pulse in a frame period synchronized with a burst signal of the occupied channel immediately preceding said unoccupied channel on the time axis; means responsive to the termination of the burst signal of the occupied channel for extracting another pulse in the frame period synchronized with the frame synchronization signal of said unoccupied channel; and a phase synchronization oscillating circuit for generating frame synchronization signals in synchronism with said pulses.

## 4,129,756
## TELEPHONE EXCHANGE SIGNALLING UNIT

**Bernard M. H. Depouilly, Paris, and Edouard M. J. A. I. Issenmann, Versailles, both of France, assignors to Le Material Telephonique, Boulogne-Billancourt, France**

**Filed Sep. 20, 1977, Ser. No. 834,874**
**Claims priority, application France, Sep. 24, 1976, 76 28776**
**Int. Cl.² H04M 3/22**
**U.S. Cl. 179—175.2 R** **7 Claims**

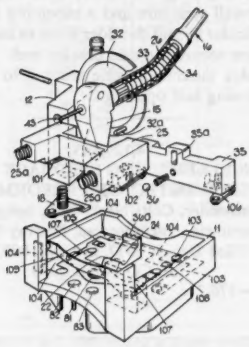



1. A telephone exchange signalling unit adapted to constitute an interface interconnected between a pulse code modulated signal junction and a telephone exchange control unit which signalling unit is capable of receiving, comparing, and exchanging signalling and synchronization data in the form of binary multiplet arrays between said control unit and said pulse code modulated signalling junction wherein said signalling unit comprises a reception memory capable of receiving and storing signals from said junction, wherein the output of said reception memory is connected to the input of the control unit and is capable of making said data signals available to said control unit, the output of said control unit is connected to the input of a transmission memory and said signals are capable of being transferred from said control unit to said transmission memory; a decoder is attached between said control unit and said transmission memory which is capable of intercepting certain pulse code data signals having predetermined characteristics thereby preventing the introduction of said certain data signals to the transmission memory and making said intercepted data signals available instead at a register for further manipulation in a looping feedback circuit, which circuit is capable of comparing such intercepted data with the data received from said pulse code modulated signal junction; means are further provided for subsequently returning the intercepted data signals to said pulse code modulated signal junction from said signalling unit.

## 4,129,757
## ELECTRICAL SWITCH ASSEMBLY

**Edward Cryer, Higham, Nr. Burnley, England, assignor to Lucas Industries Limited, Birmingham, England**

**Filed Jul. 9, 1976, Ser. No. 703,870**
**Claims priority, application United Kingdom, Jul. 9, 1975, 28828/75**
**Int. Cl.² H01H 9/00, 3/16**
**U.S. Cl. 200—4** **6 Claims**



1. An electrical switch assembly including a body, movable means supported on the body for movement relative thereto, first and second sets of electrical contacts operable by movement of said movable means relative to the body in first and second generally mutually perpendicular directions respectively, an operating lever extending from the body and coupled to said movable means to facilitate movement of said movable means relative to the body in either of said mutually perpendicular directions, an operating member rotatably mounted on the lever adjacent the free end of the lever for movement relative to the lever about the axis of the free end region of the lever, the lever being bent intermediate the operating member and the movable means, a third set of electrical contacts supported by the body and operated by rotation of the operating member relative to the lever, a drive piece adjacent said movable means, said drive piece being rotatable relative to the operating lever about the longitudinal axis of that region of the lever adjacent the movable means to operate said third set of electrical contacts, a flexible sleeve encircling the bent region of the lever between the operating member and the drive piece, said sleeve coupling the operating member to the drive piece whereby rotation of the operating member relative to the lever is transmitted to the drive piece to rotate the drive piece relative to the lever and operate said third set of contacts, said drive piece including a flexible diaphragm through which the lever extends, the periphery of the diaphragm rotatably engaging the body and the diaphragm closing an aperture in the body through which the lever extends, the diaphragm flexing to permit movement of the lever relative to the body to operate

said movable means, but transmitting rotational movements of said sleeve so as to operate said third set of contacts.

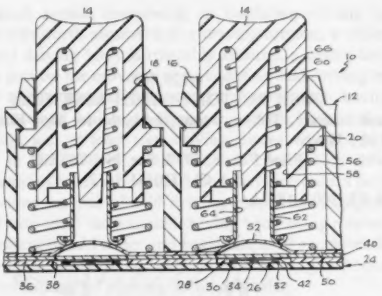
---

**4,129,758**

## KEYBOARD SWITCH ASSEMBLY HAVING FLEXIBLE CONTACT CARRYING MEMBER BETWEEN CONTACT CARRYING SUBSTRATE AND FLEXIBLE, RESILIENT, KEY-DEPRESSIBLE BUBBLE PROTRUSIONS

**Michael N. Gilano, Newport Beach, and James C. Hayes, Irvine, both of Calif., assignors to Telaris Telecommunications, Inc., Irvine, Calif.**

**Filed Jun. 10, 1977, Ser. No. 805,345**
**Int. Cl.[2] H01H** *13/70*
**U.S. Cl. 200—5 A** **1 Claim**



1. A switch assembly comprising:

a planar substrate having a conductive circuit pattern printed on a surface thereof, the circuit pattern defining a plurality of sets of switch contacts each set including at least two separate contacts;

a planar dielectric spacer disposed adjacent the surface of the substrate and having a different aperture therethrough at each of the sets of switch contacts;

a thin planar contact carrying dielectric member disposed adjacent the spacer opposite the spacer from the substrate and having a conductive circuit pattern printed on a surface thereof facing the spacer and the substrate to close a set of switch contacts on the substrate upon being forced through an aperture in the spacer and into engagement therewith;

a thin layer of flexible material having a planar portion disposed adjacent the contact carrying member opposite the spacer and having a different protrusion therein adjacent each of the different apertures in the spacer, each of the protrusions being a continuation of the layer and extending outwardly from the layer on the opposite side of the layer from the spacer; and

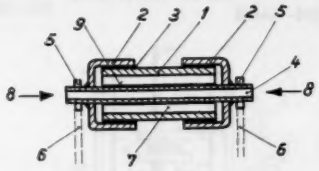
an actuator mechanism including a spring biased key, a follower, and a follower spring providing the sole coupling between the key and follower positioned adjacent each protrusion, the follower engaging the adjacent protrusion with a force that increases in response to actuation of the key by an operator to force said protrusion into engagement with the dielectric member to force the conductive circuit pattern thereon into contact closure engagement with a set of switch contacts, the follower spring limiting the force that can be applied through the follower to the protrusion even though a greater force may be applied to the key.

**4,129,759**

## PRESSURE RESPONSIVE CIRCUIT INTERRUPTER

**Alfred J. T. Hug, Beustweg 3, 8032 Zurich, Switzerland**

**Filed Jul. 16, 1976, Ser. No. 706,127**
**Claims priority, application Fed. Rep. of Germany, Jul. 18, 1975, 2532295; Feb. 16, 1976, 2606096**
**Int. Cl.[2] H01H** *35/34*
**U.S. Cl. 200—83 R** **12 Claims**



1. A pressure-responsive circuit interrupter safety device for interrupting an electrical circuit when a predetermined pressure of a fluid pressure medium is exceeded, said device comprising an enclosure having an opening, a pressure-responsive element closing said opening with respect to said pressure to be sensed and defining a sealed space in said enclosure, said element being adapted to be exposed to said pressure to be sensed; a frangible electrical conductor adapted to be connected in said electrical circuit; said element comprising a body of glass, and said electrical conductor comprising an electrically conductive coating applied to a surface of said body of glass, said pressure-responsive element being destroyed when said predetermined sensed pressure is exceeded so that said conductor is broken and said electrical circuit is interrupted.

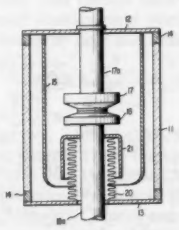
---

**4,129,760**

## VACUUM CIRCUIT BREAKER

**Tsutomu Okutomi, Kawasaki; Hisashi Yoshino, and Seishi Chiba, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan**

**Filed May 27, 1977, Ser. No. 801,214**
**Claims priority, application Japan, May 28, 1976, 51-61211**
**Int. Cl.[2] H01H** *33/66*
**U.S. Cl. 200—144 B** **4 Claims**



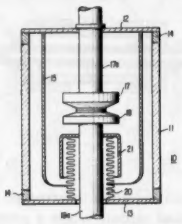
1. In a vacuum electric circuit breaker, comprising an evacuated envelope and a pair of movable conductive rods within said envelope having points of contact equipped with contact members, wherein said conductive rods are movable into and out of engaging contact, the improvement comprising:

at least one of said contacts having circuit-making and breaking members formed of an alloy consisting essentially of 4 wt% to 9.4 wt% aluminum, 0.5 wt% to 3.5 wt% beryllium, 0.1 wt% to 10 wt.% $Me_1$, wherein $Me_1$ is at least one metal selected from the group consisting of bismuth, tellurium, selenium, antimony, magnesium, and lead, and the balance copper.

## 4,129,761
## VACUUM CIRCUIT BREAKER

Tsutomu Okutomi, Kawasaki; Hisashi Yoshino; Seishi Chiba, both of Yokohama; Tadahito Tsutsumi, Fujisawa, and Kouichi Tejima, Tokyo, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kanagawa, Japan

Filed May 27, 1977, Ser. No. 801,218
Claims priority, application Japan, May 27, 1976, 51-60603
Int. Cl.[2] H01H *33/66*
U.S. Cl. 200—144 B 2 Claims



1. In a vacuum circuit breaker comprising an evacuated envelope and a pair of movable conductive rods within said envelope having points of contact equipped with contact members, wherein said conductive rods therefore are movable into and out of engaging contact, the improvement comprising:

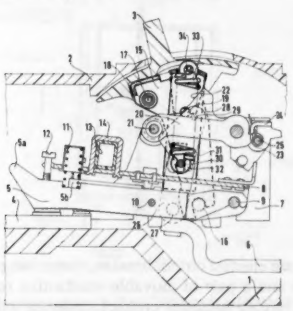
at least one of said contacts having circuit making and breaking contact members formed of an alloy consisting essentially of 9.4wt % to 15 wt % Al, 4.5 wt % to 20 wt % Ni, 0.1 wt % to 10 wt % of at least one metal (Me) selected from the group consisting of bismuth, tellurium, selenium, antimony and magnesium with copper as the balance of the alloy, wherein said alloy contains an α copper phase (Cu(α)) containing nickel and a γ copper phase (Cu(γ)) containing nickel substantially dispersed throughout said alloy.

---

## 4,129,762
## CIRCUIT-BREAKER OPERATING MECHANISM

Michel Bruchet, Saint-Quentin, France, assignor to Societe Anonyme dite: UNELEC, Paris, France

Filed Jul. 19, 1977, Ser. No. 817,527
Claims priority, application France, Jul. 30, 1976, 76 23375
Int. Cl.[2] H01H *3/54*
U.S. Cl. 200—153 G 5 Claims



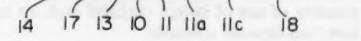
1. A circuit breaker mechanism comprising: an operating member rigidly fixed to a control handle, being free to move from a "closed" to an "open" position, said operating member having pivot means associated therewith; moving contact means free to move from a "closed" to an "open" position; an automatic tripping lever adapted to be latched as said circuit breaker mechanism assumes a closed position; linkage means disposed between the automatic tripping lever and moving contact driver; snap-action spring means anchored at one end to a shaft in said linkage means, and a lever pivotally-mounted on said pivot means carried by said operating member providing an operating area in which said shaft is engaged, the other end of said spring being anchored to said lever; said lever, linkage means, and attachment of said spring being such, to enable said mechanism to proceed from a position in which the spring acts in the direction of breaker closing, to one in which it acts in the direction of breaker opening in response to a first portion of the control handle's travel; and said mechanism acting through said linkage means in the direction of breaker opening established between said operating member and driver in response to a second portion of the control handle travel, when said moving contact means do not break contact under the urging of said snap action spring means during said first, portion of travel of said control handle travel.

---

## 4,129,763
## PUSH BUTTON SWITCH ASSEMBLY

Taneo Murata, Tokyo, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Feb. 8, 1977, Ser. No. 766,802
Int. Cl.[2] H01H *3/12*
U.S. Cl. 200—159 A 2 Claims




1. A pushbutton switch comprising:

a base plate;

a frame mounted on said base plate and having its opposite ends open;

a movable contact member formed integrally with an attachment portion attached to said frame, a snap-action disc portion bowing at its center away from said base plate and provided at its center with a contact and at its peripheral points with one or more contacts, and a connection portion connecting said attachment portion and said disc portion;

an insulating plate attached to said frame and underlying said connection portion, said insulating plate having a projection extending upwardly and abutting on said connection portion to urge said disc portion upwardly out of contact from said base plate;

said base plate having fixed contacts located in the positions corresponding to said respective movable contacts on said disc portion; and

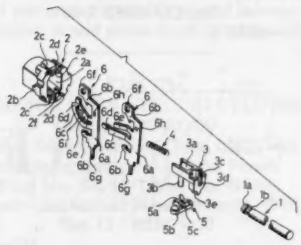
a pushbutton supported for reciprocating movement in said frame to push said movable contact member toward said base plate so that said movable contacts located at said peripheral points first come into contact with said respective fixed contacts and then said disc portion is snapped toward said base plate so as to bring said movable contact located centrally on said disc portion into contact with said fixed contact on said base plate.

4,129,764

## PUSH SWITCH

Masao Ohkita, and Hidetoshi Sato, both of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Jul. 14, 1977, Ser. No. 815,715
Claims priority, application Japan, Jul. 15, 1976, 51-94285
Int. Cl.[2] H01H *13/52*
U.S. Cl. 200—159 R 12 Claims



1. A push switch comprising an insulating driving body having a cam-teeth section and a driving section, a slider to which said driving body is rotatably secured, a casing having a hollow section for movably accomodating said driving body and said slider, at least two metal members each having a contact piece and which are disposed in said hollow section of said casing, and at least two driving pieces which are also disposed in said hollow section of said casing, said driving pieces clamping said cam-teeth section therebetween, a projection provided on one of said driving pieces for engagement with said cam-teeth section, said driving body being rotated by the movement of said slider and engagement of a cam-teeth by said projection, said driving body rotation moving said contact pieces into and out of contact with each other.

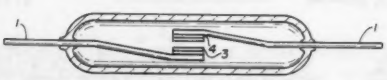
---

4,129,765

## ELECTRICAL SWITCHING CONTACT

Günther Herklotz, Bruchköbel, and Walter Reichelt, Hanau, both of Germany, assignors to W. C. Heraeus GmbH, Hanau am Main, Germany

Filed Aug. 8, 1977, Ser. No. 822,729
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1976, 2638135
Int. Cl.[2] H01H *1/66*
U.S. Cl. 200—268 15 Claims



1. Low-current rem-reed switch contact encased in a housing under vacuum or a protective gas comprising a substrate of medium-hard magnetic material having a coercive field strength of from 20 to 90 Oe containing anomalies on the surface thereof,

an intermediate layer of a thickness from 1 to 20 μm coated on at least a portion of said substrate, said intermediate layer consisting of at least one metal selected from the group consisting of titanium, zirconium, hafnium, vanadium, niobium and tantalum, and

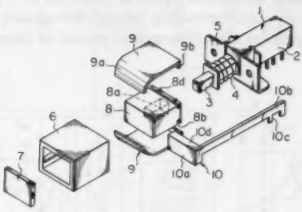
an outer contact layer between 1 and 10 μm thick on said intermediate layer, said outer contact layer comprising a noble metal or noble metal alloy.

4,129,766

## INDICATING MECHANISM FOR PUSH BUTTON SWITCHES

Hiroyasu Miyata, and Sadayoshi Iwasaki, both of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Apr. 14, 1977, Ser. No. 787,542
Claims priority, application Japan, Apr. 22, 1976, 51-50463[U]
Int. Cl.[2] H01H *9/16*
U.S. Cl. 200—308 1 Claim



1. In an indicating mechanism for a pushbutton switch having a slide movable between a first outer position and a second inner position, said slide being movable inwardly past said second position for locking or unlocking said slide from said second position; said indicating mechanism comprising

a hollow nob adapted to be connected for movement with said slide and having a transparent window in its end portion;

an indicating member having an indicating surface disposed slidably within said nob; and

at least two shutter members disposed within said nob and having portions able to extend between said indicating surface and said window for preventing said indicating surface from being viewed through said window;

the improvement comprising:

said shutter members being formed from a resilient material and having said portions thereof biased towards one another; and

means for moving said shutter members with said nob;

whereby as the switch slide is pushed from its first position, said indicating surface will be moved between said portions of the shutter members to spread them apart resiliently to permit visual detection of said indicating surface and as the switch slide returns back from being pushed passed its second position, said portions of the shutter members will resiliently hold said indicating member near said window.

---

4,129,767

## INDUCTION HEATING APPARATUS HAVING TIMING MEANS RESPONSIVE TO TEMPORARY REMOVAL OF COOKING IMPLEMENT

Keizo Amagami; Masatatsu Nakamura; Hideyuki Kominami; Kouji Funakoshi; Mitsuyuki Kiuchi, and Takumi Mizukawa, all of Kadoma, Japan, assignors to Matsushita Electric Industrial Company, Limited, Japan

Continuation-in-part of Ser. No. 587,706, Jun. 17, 1975, abandoned. This application Jul. 22, 1977, Ser. No. 818,322
Int. Cl.[2] H05B *5/04*
U.S. Cl. 219—10.49 R 1 Claim

1. An induction heating apparatus comprising;

a d.c. power supply circuit,

a static power inverter connected to the d.c. power supply circuit for producing a high-frequency oscillating current,

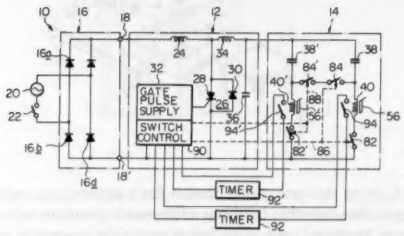
an induction heating unit having a plurality of heater coils connected to the static power inverter for producing a commutating magnetic field around each of the heater coils,

capacitors respectively connected in series with the heater coils,

a plurality of first switches each connected between the static power inverter and each of the heater coils,

a plurality of second switches each provided in the vicinity of each of the plurality of the heater coils and responsive to removal of a load to be heated from its corresponding heater coil to be rendered open,

a plurality of timing circuits respectively connected in series with the second switches, each of the timing circuits producing an output signal in response to a condition in which the corresponding one of the second switches is kept open for a predetermined period of time,




a switch control circuit having input terminals connected to the timing circuits, being linked with the first switches through respective linkage linking the first switches to the switch control circuit, and being actuated by the output signal from each of the timing circuits so that the first switch associated with the timing circuit delivering the output signal is rendered open, and

a plurality of third switches connected in series and provided between junctions defined by the capacitors and the heater coils, each of the third switches being linked to the switch control circuit through respective said linkages for being rendered open when the first switch associated with the timing circuit delivering the output signal is rendered open by means of the switch control circuit.

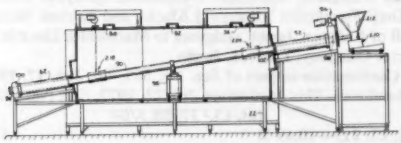
---

**4,129,768**

## METHOD AND APPARATUS FOR MICROWAVE HEATING OF FLOWABLE MATERIAL

**Eldon E. Anderson, Mountain View, Calif., assignor to Gerling Moore, Inc., Santa Clara, Calif.**

**Filed Jan. 7, 1977, Ser. No. 757,602**
**Int. Cl.² H05B 9/06**
**U.S. Cl. 219—10.55 A** **17 Claims**



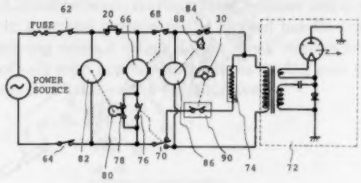
1. In a method for heating flowable material in a microwave oven having a microwave transparent tube extending therethrough, the steps of rotating said tube, said tube being inclined at an angle to the horizontal such that the material will flow through the tube as the tube is rotated, feeding material into the upper end of said tube, and removing material having passed through said tube from its lower end.

**4,129,769**

## TIMER ARRANGEMENT IN A COMBINATION MICROWAVE OVEN AND ELECTRIC HEATING OVEN

**Yutaka Takagi, Sakai, and Munemitsu Toyoda, Osaka, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Mar. 11, 1977, Ser. No. 776,663**
**Claims priority, application Japan, Mar. 11, 1976, 51/26704; Mar. 12, 1976, 51/27387; Mar. 15, 1976, 51/28293; Mar. 19, 1976, 51/33508[U]**
**Int. Cl.² H05B 9/06**
**U.S. Cl. 219—10.55 B** **10 Claims**




1. A combination microwave oven and electric heating oven comprising:

a. an oven compartment;

b. a microwave generator for performing microwave heating cooking;

c. a heater means disposed within said oven compartment for performing electric heating cooking;

d. a selection means for selectively energizing the microwave generator and the heater means;

e. a timer arrangement including a timer setting means for setting a desired cooking period, and a timer motor associated with the timer setting means; and

f. switching means associated with said selection means for continuously enabling said timer motor when the combination microwave oven and electric heating oven is placed in a microwave heating cooking mode, and for intermittently enabling said timer motor when the combination microwave oven and electric heating oven is placed in an electric heating cooking mode, whereby said timer arrangement functions as a short interval timer in the microwave heating cooking mode and as a long interval timer in the electric heating cooking mode.

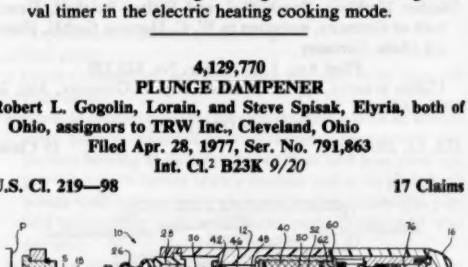
---

**4,129,770**

## PLUNGE DAMPENER

**Robert L. Gogolin, Lorain, and Steve Spisak, Elyria, both of Ohio, assignors to TRW Inc., Cleveland, Ohio**

**Filed Apr. 28, 1977, Ser. No. 791,863**
**Int. Cl.² B23K 9/20**
**U.S. Cl. 219—98** **17 Claims**



1. Apparatus for welding a stud to a surface of a workpiece by a drawn-arc, stud welding technique, said apparatus comprising a welding tool body, means carried by said body for

holding the stud with an end toward the workpiece, means for establishing a welding arc between the stud and the workpiece when the stud is spaced from the workpiece, means for moving the holding means and the stud toward and away from the workpiece, and means for slowing the movement of the stud toward the workpiece by said moving means, and including means forming a cylinder affixed to a rear portion of said welding tool body, a piston in said cylinder, a piston rod connected to said stud moving means, and means connecting said piston to said piston rod to enable pivotal movement of said piston rod relative to said piston in all directions.

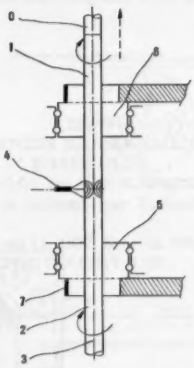
---

**4,129,771**

## METHOD FOR BUTT-WELDING CYLINDRICAL METALLIC RODS

**Jacques Pinettes, Gieres, and Jean Chaix, Claix, both of France, assignors to Alliages Frittes S.A., Paris, France**

**Filed May 10, 1977, Ser. No. 795,641**
**Claims priority, application France, May 31, 1976, 76 17172**
**Int. Cl.[2] B23K *9/02***
**U.S. Cl. 219—104** **10 Claims**




1. The method of butt welding hard facid metallic rods of substantially the same diameter without filler metal and without radial deformation in the welded area comprising the steps of bringing the ends of two adjacent coaxial rods having a common axis into contact with each other without compressive stress, welding said rod ends together by a heat source sufficient to accomplish said weld, while simultaneously rotating the rods about their common axis with respect to said heat source for at least more than one complete revolution at controlled a speed whereby the welded area forms with the unwelded area of the rods a substantially smooth surface and a rimless joint is formed between the ends of said coaxial rods.

---

**4,129,772**

## ELECTRODE STRUCTURES FOR HIGH ENERGY HIGH TEMPERATURE PLASMAS

**Gerald A. Navratil, and George R. Neil, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.**

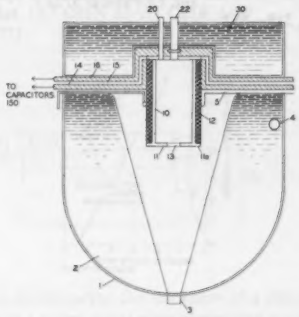
**Filed Oct. 12, 1976, Ser. No. 731,801**
**Int. Cl.[2] B23K *9/00***
**U.S. Cl. 219—121 P** **5 Claims**

1. Apparatus for heating plasmas by plasma focusing, comprising:

(a) means for generating and containing a vortex of liquid conducting metal;

(b) an inner electrode mounted within and spaced away from said vortex of liquid conducting metal, said electrode having a substantially cylindrical portion whose major axis is coincident with the axis of rotation of said vortex, and an annular member having an aperture therein which is mounted on the bottom end of said cylindrical portion and electrically connected thereto, said inner electrode being electrically insulated from said liquid metal vortex;

(c) a substantially cylindrical insulator surrounding the cylindrical portion of said electrode and leaving said annular member substantially exposed, whereby when a selected high voltage is applied between said inner electrode and




said liquid metal vortex, a sheet of electrical current discharge is formed between said annular member and said vortex which travels from the top end of said vortex to the bottom thereof to form a focus for plasma forming gas injected into the focus area through said aperture in said annular member.

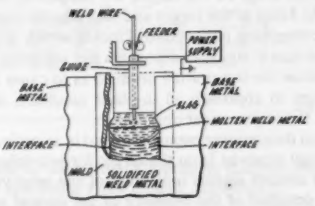
---

**4,129,773**

## CONSUMABLE GUIDE TUBE ASSEMBLY

**Charles E. Ridenour, Chicago Heights; Herman A. Fabert, Jr., Homewood, both of Ill.; John Tasker, West Milford, and Hugo R. Larson, Ridgewood, both of N.J., assignors to Abex Corporation, New York, N.Y.**

**Division of Ser. No. 613,040, Sep. 12, 1975, Pat. No. 4,054,919.**
**This application Mar. 28, 1977, Ser. No. 781,587**
**The portion of the term of this patent subsequent to Aug. 1, 1995, has been disclaimed.**
**Int. Cl.[2] B23K *35/22***
**U.S. Cl. 219—146.23** **2 Claims**

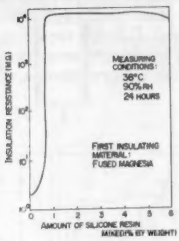



1. An electroslag welding device constituting a source of metal for welding by the electroslag process and consisting of a stainless steel guide sleeve both to resist embrittlement of the weld metal and to lend structural support to an electrode, a tube of copper inside, and supported by, the guide sleeve and serving as an electrode for conducting the current away from the guide sleeve, and a weld wire inside the copper tube.

## 4,129,774
## FILLING MATERIALS FOR HEATING ELEMENTS

Tozaburo Inano, Chigasaki; Katsuhiro Yamazaki, Matsudo, and Minoru Otake, Kashiwa, all of Japan, assignors to Hitachi Heating Appliances Co., Ltd., Japan

Filed Aug. 13, 1976, Ser. No. 714,179
Claims priority, application Japan, Aug. 28, 1975, 50-104226
Int. Cl.[2] H05B 3/18
U.S. Cl. 219—552 10 Claims




1. A heating element consisting of a metal pipe, an electric resistance conductor inserted into the metal pipe and a heat resistant insulating material filled between said metal pipe and said electric resistance conductor, characterized in that said heat resistant insulating material is one obtained by mixing with a first insulating material of particulate fused magnesia 1.0 to 5.0% by weight of a second insulating material selected from the group consisting of a silicone resin powder, an epoxy resin powder, polytetrafluoroethylene resin powder, and an unsaturated or copolymerized polyester resin powder, said second insulating material having a lower melting temperature than that of the first insulating material based on the weight of the first insulating material, and heating the mixture to a temperature at which the second insulating material is molten to melt the second insulating material and coat the surface of the first insulating material with the molten second insulating material.

---

## 4,129,775
## GLINT CAPTURE SYSTEM FOR IMPROVING LOCK STABILITY OF COAT

Thomas R. O'Meara, Malibu, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed May 31, 1977, Ser. No. 801,897
Int. Cl.[2] G01J 1/20
U.S. Cl. 250—203 R 12 Claims

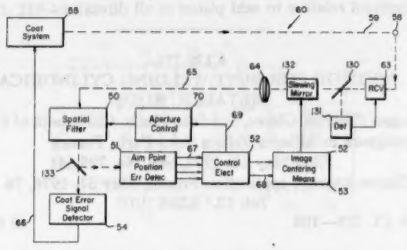
1. An adaptive optical system having means for transmitting optical energy to and for receiving optical energy from a target such that modulation signal components, derivable from the received energy beam and originating from energy from various discrete areas on the target, are indicative of the phasing across the beam at the target and said adaptive optical system further comprising phase control means which is responsive to said modulation signal components for adjusting the relative phase across the transmitted beam so as to cause the transmitted energy to approach an in-phase condition at the target, wherein the improvment comprises:

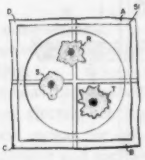
position determining means disposed in an optical path of the energy received from the target f providing beam position control signals indicative of .ie relative position of the centroid of the intensity of the optical energy in the received energy beam;

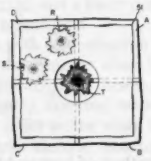
variable aperture means, interposed in an optical path of the received energy and including an adjustable aperture, for passing only that portion of the received energy beam applied thereto which is in alignment with said adjustable aperture;

phasing control detector means responsive to the received energy which passes through said adjustable aperture, for providing said modulation signal components to said phase control means;

position control means responsive to said position control signals for adjusting the spatial orientation between the received energy beam applied to said variable aperture means, and said variable aperture means, such that the centroid of the optical energy in said received beam is substantially centered within said aperture; and





aperture control means, responsive to said position control signals, for reducing the size of said aperture when the centroid of the intensity of the optical energy in said received energy beam is substantially centered within said aperture;

whereby modulation signal components originating from areas on the target whose return energy is not in alignment with said adjustable aperture do not effect adaptive phase control of said transmitted beam.

---

## 4,129,776
## DETECTION OF SUBSURFACE AIR FLOW

Robert L. Fleischer, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 22, 1977, Ser. No. 808,963
Int. Cl.[2] G01V 5/00
U.S. Cl. 250—253 7 Claims

1. A method for determining whether air flow is occurring into or out of the earth's surface at a given location comprising the steps of:

excavating a first hole to a depth in the range of from about 20 cm to about 60 cm;

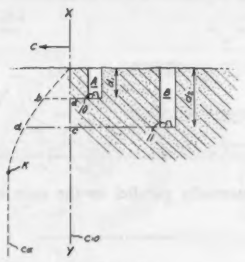
excavating a second hole to a depth greater than about 1.5 the depth of said first hole, said second hole being at a distance from said first hole at least as great as the depth of said second hole;

disposing in each of said holes identical means for detecting the presence of alpha particles;

determining the concentration of alpha particles encountered at the bottom of each of said holes due to the pres-

ence of radon during some predetermined period of exposure; and

calculating the ratio of the concentration of radon at the



bottom of said second hole to the concentration of radon at the bottom of said first hole, the numerical value so determined providing an assessment of whether subsurface air flow was occurring and, if so, in which direction.

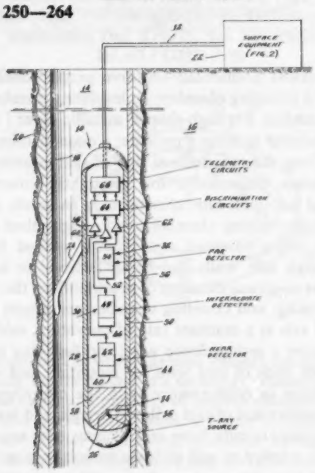
---

**4,129,777**

## CEMENT THICKNESS MEASUREMENTS IN CASED BOREHOLES

**John S. Wahl, Ridgefield, and Nick A. Schuster, Darien, both of Conn., assignors to Schlumberger Technology Corporation, New York, N.Y.**

**Filed Jun. 13, 1977, Ser. No. 806,247**
**Int. Cl.[2] G01V *5/00***
**U.S. Cl. 250—264** **23 Claims**



1. A method for logging a borehole traversing an earth formation and having solid matter along at least a portion of the wall thereof, comprising the steps of:

emitting gamma radiation from the borehole into the surrounding media;

detecting gamma radiation which returns to the borehole as a result of the interaction of the emitted radiation with three respective radial layers of the surrounding media, each beginning approximately at the borehole and extending to different radial depths; and

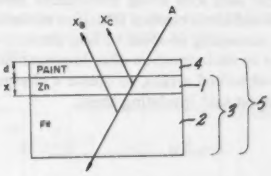
obtaining from the detected radiation a representation of the thickness of said solid matter.

**4,129,778**

## METHOD AND APPARATUS FOR MEASURING THE THICKNESS OF A NON-METALLIC COATING ON A PLATED METAL PLATE

**Akira Inoue, and Minori Oka, both of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan**

**Filed Jul. 12, 1977, Ser. No. 815,019**
**Claims priority, application Japan, Jul. 12, 1976, 51-82727**
**Int. Cl.[2] G01N *23/20*; G21K *1/00***
**U.S. Cl. 250—272** **7 Claims**




1. A method of measuring the thickness of a non-metallic covering layer on a plated metal plate comprising a metal base plate and a plating metal layer, said method comprising applying to the covered side of said metal plate radiant rays to produce fluorescent X-rays including fluorescent X-rays emitted from said plating metal layer and fluorescent X-rays emitted from said base plate, measuring the intensity of said fluorescent X-rays emitted from said plating metal layer and the intensity of said fluorescent X-rays emitted from said base plate, and deriving the thickness of said covering layer from said intensity of said fluorescent X-rays emitted from said plating metal layer and said intensity of said fluorescent X-rays emitted from said base plate.

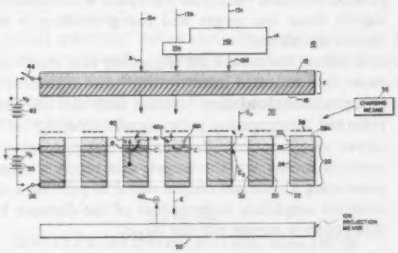
---

**4,129,779**

## PHOTOCONTROLLED ION-FLOW ELECTRON RADIOGRAPHY APPARATUS WITH MULTI-LAYERED MESH STRUCTURE

**Jack D. Kingsley, and Kei-Hsiung Yang, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Filed Sep. 19, 1977, Ser. No. 834,649**
**Int. Cl.[2] G03D *41/16***
**U.S. Cl. 250—315 A** **25 Claims**



1. Apparatus for use in the radiographic analysis of an object differentially absorbing x-ray quanta, comprising:

a first electrode supporting a sheet of insulating material;

a control mesh structure spaced from said first electrode to form a gap therebetween, said control mesh structure including, disposed sequentially away from said first electrode, a layer of a photoconductive insulating material; a thin film of a transparent and conductive material; a layer of material for conversion of x-ray quanta to photons in the ultraviolet and visible spctral regions; and a conduc-

tive mesh screen; said mesh control structure having a two-dimensional array of apertures formed therethrough;

means for depositing a quantity of a first polarity of electrical charge substantially uniformly adjacent a surface of said photoconductive layer facing said gap;

means for emitting a stream of ions of said first polarity toward said mesh electrode of said control mesh structure; and

means for applying an electric field across the gap for accelerating said ions toward said insulating layer of said first electrode; said ions being transmitted through the apertures of said mesh control structure and modulated by the charge remaining in areas of said photoconductive layer adjacent to each aperture after impingement of the differentially-absorbed x-rays, to create a charge image of said object upon said insulating sheet.

---

**4,129,780**

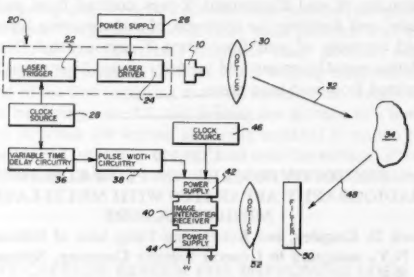
**ACTIVE IMAGING SYSTEM USING TIME PROGRAMMED DWELL**

**Richard H. Laughlin, Richardson, Tex., assignor to Varo, Inc., Garland, Tex.**

**Filed Jun. 21, 1977, Ser. No. 809,052**

**Int. Cl.[2] H01J *31/49***

**U.S. Cl. 250—333** **31 Claims**




1. An imaging system for detection of a target comprising:

an electromagnetic radiation source for generating a series of interrogating pulse signals directed towards the target;

receiver means operable to be triggered for receiving during preselected time intervals reflected interrogating pulse signals from the target and for generating a resultant output signal; and

circuit means connected for triggering said receiver means to receive reflected interrogating pulse signals according to a predetermined time function such that the number of reflected interrogating pulse signals received by said receiver means is dependent on the distance between said receiver means and the target, said receiver means thus generating a resultant output signal to provide a signal of constant amplitude independent of the distance between said receiver means and the target.

---

**4,129,781**

**FILM THICKNESS MEASURING APPARATUS AND METHOD**

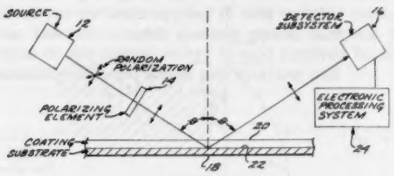
**Walter M. Doyle, 2875 Bernard Ct., Laguna Beach, Calif. 92651**

**Filed May 17, 1976, Ser. No. 687,240**

**Int. Cl.[2] G01J *1/00***

**U.S. Cl. 250—341** **7 Claims**

1. An apparatus for measuring the thickness of a film on a reflecting surface wherein the measurement is optically accomplished by light radiation propagating in a plane of incidence




which is substantially parallel to the stria in the reflecting surface.

---

**4,129,782**

**CURVED LOCATION-SENSITIVE PROPORTIONAL COUNTER TUBE**

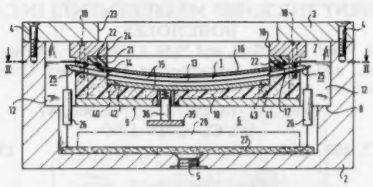
**Werner Kreutz, Staufen, Fed. Rep. of Germany, assignor to M. Braun GmbH, Oberschleissheim, Fed. Rep. of Germany**

**Filed Aug. 25, 1977, Ser. No. 827,605**

**Claims priority, application Fed. Rep. of Germany, Nov. 4, 1976, 2650607**

**Int. Cl.[2] G01T *1/18***

**U.S. Cl. 250—379** **6 Claims**



1. In a curved positionally-sensitive proportional counter tube having a counting chamber; an insulating member in said counting chamber; a trough-shaped metallic layer lining said insulating member to form a cathode; a counter tube window extending along the longitudinal side of said counting chamber; a radiation transmissive foil gas-tightly covering said window; and a counter tube wire forming an anode, said wire traversing said counting chamber in the longitudinal direction thereof and being mounted equidistantly spaced from said metallic trough side walls and being fastened at both ends thereof to the electrical elements of preamplifiers, the improvement comprising: said counting chamber being bent along its longitudinal axis at a constant rate of curvature, said counter tube wire being a spring-elastic wire; and fastening means for gripping both ends of said wire for mounting said wire in a curved position in conformance with the curvature of said counting chamber and of said cathode-trough, and maintaining said wire asymmetrically from said counter tube window and equidistantly relative to said cathode trough base surface.

---

**4,129,783**

**HIGH SPEED COMPUTERIZED TOMOGRAPHY IMAGING SYSTEM**

**John M. Houston, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Continuation-in-part of Ser. No. 683,884, May 6, 1976, abandoned. This application Oct. 3, 1977, Ser. No. 838,458**

**Int. Cl.[2] A61B *6/02*; G01N *23/08***

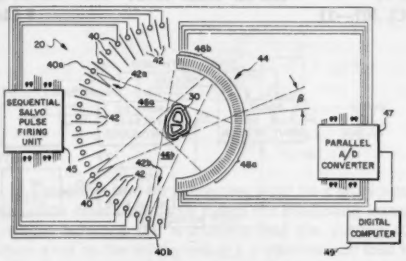
**U.S. Cl. 250—445 T** **8 Claims**

7. A method for generating tomographic image data from body structures comprising the steps of:

disposing an array of x-ray sources about said body structures;

disposing an array of x-ray detectors about said body structures opposite said array of x-ray sources;

collimating x-ray energy from each of said sources into a beam which illuminates only a fraction of said x-ray detector array; and




simultaneously pulsing a subset of x-ray sources in said array, the sources in said subset being selected so that x-ray energy from each said simultaneously pulsed sources illuminates a separate and distinct fraction of said x-ray detectors, whereby x-ray transmission data along a plurality of ray paths is obtained in a fast and unambiguous manner.

---

**4,129,784**

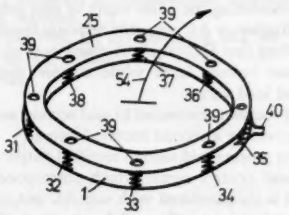
## GAMMA CAMERA

**Edgar Tschunt, Erlangen; Winfried Platz, Ratsberg; Ulrich Bär, Nuremberg, and Lothar Heinz, Erlangen, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany**

**Continuation of Ser. No. 479,425, Jun. 14, 1974, which is a continuation of Ser. No. 324,063, Jan. 16, 1973, abandoned. This application Dec. 8, 1975, Ser. No. 638,346**

**Int. Cl.[2] G21K** *1/02*

**U.S. Cl. 250—505** **8 Claims**



1. In combination with a gamma camera having means for exchangably mounting any of a series of collimators in the ray inlet of the camera, a plurality of reserve collimators, holders carrying said reserve collimators, a device for supporting said holders, said device comprising a column having a vertical axis, and means connected with said column and supporting said holders swingably one above the other, said holders each comprising a swinging support mounted for swinging movement about the vertical axis of the column, and a separate insert carried by the support for swinging movement therewith about the vertical axis of the column, each insert having a bearing surface for supporting one of said collimators thereon for transfer to the mounting means of the camera, the inserts of the respective holders being selectively swingable with the respective supports to respective positions in vertical alignment with the mounting means of the camera for selective transfer of the collimator supported by any of the inserts to the mounting means of the camera, and for subsequent return of each collimator from the mounting means of the camera to one of the inserts after use, each of said inserts having a series of springs connecting such insert with its respective support for accommodating slight lateral shifting of the insert relative to its support during exchange of the collimator between the mounting means of the camera and the bearing surface of the insert.

---

**4,129,785**

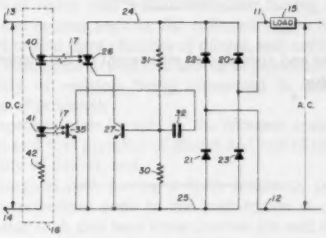
## SOLID STATE SWITCH

**Zagloul B. Kadah, San Jose, Calif., assignor to Monsanto Company, St. Louis, Mo.**

**Filed Oct. 31, 1977, Ser. No. 846,966**

**Int. Cl.[2] G02B** *27/00*

**U.S. Cl. 250—551** **9 Claims**




1. A solid state switch circuit comprising, in combination:

a pair of power terminals connectable in series with a load and in series with an A.C. source of power;

a single phase, full-wave bridge rectifier circuit having A.C. terminals and D.C. terminals; said D.C. terminals being a positive terminal and a negative terminal; said pair of power terminals connected to said A.C. terminals;

a first optically responsive conductive device having a pair of main terminals and a control terminal; said pair of main terminals of said first optically responsive conductive device being connected to said D.C. terminals of said full-wave bridge rectifier circuit;

zero-cross firing circuit means coupled between said D.C. terminals of said full-wave bridge rectifier circuit and coupled to said control terminal of said first optically responsive conductive device; said zero-cross firing circuit means having a voltage divider means;

a capacitor and a second optically responsive conductive device connected in series from a point intermediate of said voltage divider means to said negative terminal of said D.C. terminals;

and optical generator means optically coupled to said first and second optically responsive conductive devices; said optical generator means having a pair of D.C. terminals for receiving input signals for the operation of said solid state switch circuit.

---

**4,129,786**

## RIM-TYPE HYDROELECTRIC MACHINE

**Helmut Miller, Niederrohrdorf, Switzerland, assignor to Escher Wyss Limited, Zurich, Switzerland**

**Filed Nov. 23, 1976, Ser. No. 744,250**

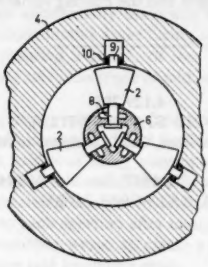
**Claims priority, application Switzerland, Dec. 2, 1975, 15611/75**

**Int. Cl.[2] F01D** *15/10, 7/00*

**U.S. Cl. 290—52** **5 Claims**

1. In a hydroelectric machine set which includes a service water duct, a hydraulic machine having a wheel within the duct which carries radially extending blades, and an electrical machine which surrounds the duct and the bladed wheel in the manner of a rim and has a rotor, the improvement which

comprises torque-transmitting connections between the external ends of the blades and the rotor which allow free radial




movement and also pivotal movement of the blades relatively to the rotor.

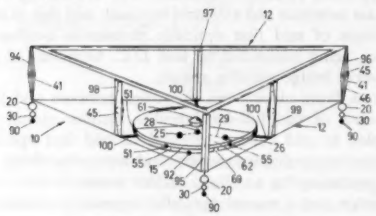
---

**4,129,787**

## DOUBLE WIND TURBINE WITH FOUR FUNCTION BLADE SET

**Florencio N. Palma, 263 Keele St., Toronto, Canada**

**Filed Apr. 19, 1977, Ser. No. 788,798**
**Int. Cl.[2] F03D *7/06***
**U.S. Cl. 290—55** **7 Claims**



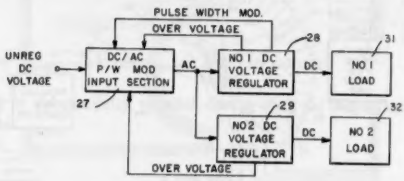

1. A Free-Standing, Self-Starting, Vertical-Axis Rotor for Natural Energy Harnessing comprising; an equilateral triangular frame having a plurality of vertical airfoil blades having bilateral stress dampers to dissipate the centrifugal and aerodynamic stresses and supress blade flutter at high operating speeds; pivoted airfoil blades controlled by servo motors in response to controller signals in reference to anemometer signals in phase with the prevailing winds and in which the angle of attack of the blades is monitored by servomechanisms which also provide input signals to the said controller, allowing for control of the angle of attack of the pivoted blades for aerodynamic efficiency and also allowing the pivoted blades to operate as a drag turbine for self-starting in low wind speeds, further allowing operation as a lift-type turbine for high velocities of rotation and also the pivoted blades to be operated as aerodynamic brakes for arresting of operation; said frame mounted on a ring shaped tower base riding on wheels, said wheels disposed in a circular pattern and mounted on pillars allowing the harnessing of energy at gound level; said ring shaped tower base forming the frame of a ring shaped armature of an electromagnetic energy converter common to a number of stators mounted adjacently to it, to allow transfer of the harnessed energy by electromagnetic induction directly, at ground level.

**4,129,788**

## HIGH EFFICIENCY DC TO DC CONVERTER

**Theodore E. Chavannes, Woodland Hills, Calif., assignor to Dracon Industries, Chatsworth, Calif.**

**Filed Apr. 26, 1977, Ser. No. 790,976**
**Int. Cl.[2] H02P *13/26***
**U.S. Cl. 307—11** **8 Claims**




1. A dual output, high efficiency, low output ripple DC to DC converter, comprising

an input section receiving a DC input and providing a substantially constant frequency AC output,

a transformer having a primary winding receiving said AC output and having first and second secondary windings,

a first rectifier connected to said first secondary winding and providing a first rectified output,

a series inductance and parallel capacitance filter receiving said first rectified output and providing a smoothed first DC output,

smoothing means for sensing said first rectified output and providing a first control signal corresponding thereto,

a first regulator means for receiving said first rectified output and said first control signal and providing a feedback signal in response to said first control signal when said smoothed first DC output exceeds a predetermined reference level,

means in said input section receiving said feedback signal and modulating the pulse width of said substantially constant frequency AC output in response thereto, so that said smoothed first DC output is maintained at a substantially constant voltage level while current demand from an applied load varies,

a second rectifier connected to said second secondary winding providing a second rectified output,

means for sensing said second rectified output and providing a second control signal which corresponds thereto and which is synchronized with said AC output,

a series inductance and parallel capacitance filter receiving said second rectified output and providing a smoothed second DC output,

a second regulator means for receiving said smoothed second DC output and said second control signal and providing a switching output in response thereto,

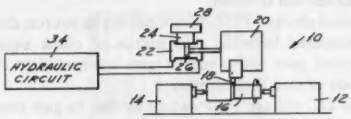
an electronic switch connected with said second regulator means and being actuated by said switching output and operating to modulate the pulse width of said second rectified output, so that said smoothed second DC output is maintained at a substantially constant voltage level while current level demand from an applied electrical load varies,

a series diode preload resistor circuit connected across said smoothed second DC output, said preload resistor circuit being coupled to said electronic switch and operating to provide driving current therefor when said switch is in the on condition and high load current is required at said smoothed second DC output, and to preload said second regulator means when said switch is in the off condition and low load current is required to said smoothed second DC output.

## 4,129,789
## TOOL LOAD SENSOR AND CONTROL CIRCUIT

James D. Phillips, 548 Plymouth, Alpena, Mich. 49707

Filed Jan. 30, 1976, Ser. No. 653,660
Int. Cl.[2] H01H *35/24, 45/00*
U.S. Cl. 307—118 11 Claims



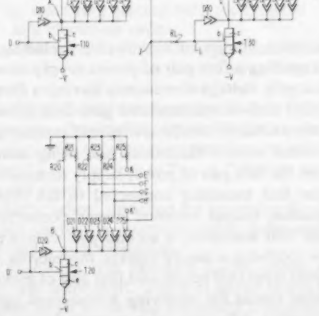

1. In a machine tool for producing a cut on a workpiece, the combination comrising drive means for producing translatory movement between the workpiece and the cutting tool to produce a cut on the workpiece at a predetermined feed rate so that the force required to operate said drive means varies in accordance with the load on the cutting tool, said drive means including a drive piston coupled to the cutting tool and adapted to reciprocate the cutting tool relative to the workpiece through a predetermined stroke to effect a cutting pass on the workpiece and hydraulic fluid drive means for producing a predermined constant drive pressure on one face of said piston to displace the tool in the work-cutting direction, said hydraulic fluid drive means being adapted simultaneously to produce a back pressure on the opposing face of said piston which varies as a function of contact pressure between the cutting tool and the workpiece, pressure sensing means responsive to the pressure differential between said one face and said opposing face of said piston, and means actuated by said pressure sensing means for de-activating said drive means in response to said pressure differential exceeding a preselected threshold value.

---

## 4,129,790
## HIGH DENSITY INTEGRATED LOGIC CIRCUIT

Venkappa L. Gani, and Frank A. Montegari, both of Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 21, 1977, Ser. No. 862,704
Int. Cl.[2] H03K *19/08, 19/12, 19/20*
U.S. Cl. 307—203 9 Claims



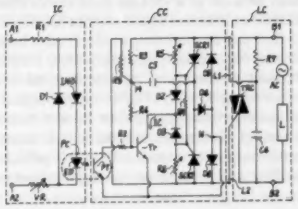
1. An improved integrated circuit comprising:
first and second sources of potential;
a first plurality of series connected resistors and diodes connected in electrical parallel with each other and in electrical series with a first transistor having collector, base, and emitter regions, the collector region being connected to said first plurality of diodes, said base region being connected to a first input terminal, said emitter region being connected to said first source of potential, said first plurality of resistors being connected to said second source of potential;
a second plurality of series connected resistors and diodes connected in electrical parallel with each other and in electrical series with a second transistor have collector, base, and emitter regions, the collector region being connected to said second plurality of diodes, said base region being connected to a second input terminal, said emitter region being connected to said first source of potential, said second plurality of resistors being connected to said second source of potential;
a third plurality of series connected resistors and diodes connected in electrical parallel with each other and in electrical series with a third transistor having collector, base, and emitter regions, the collector region being connected to said third plurality of diodes, said emitter region being connected to said first source of potential, said third plurality of resistors being connected to said second source of potential;
an intermediate node formed by the common connection of one of said first plurality of diodes and one of said second plurality of diodes; and
a metallurgical path having a finite resistance connecting said intermediate node to the base region of said third transistor such that base drive current for said third transistor proceeds in a current path from said second source of potential through one of said first or second plurality of resistors through said metallurgical path.

---

## 4,129,791
## SOLID STATE SWITCHING CIRCUIT

Ryuichi Sato, Muko, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Continuation of Ser. No. 633,817, Nov. 20, 1975, abandoned.
This application Mar. 15, 1977, Ser. No. 777,647
Claims priority, application Japan, Nov. 29, 1974, 49/138756
Int. Cl.[2] H03K *17/72*
U.S. Cl. 307—252 Q 4 Claims



1. A solid state switching circuit comprising:
an input signal circuit for receiving an input signal and producing a physical signal, and
a load circuit including a load and an A.C. power source connected in series between first and second load terminals,
a control circuit which is electrically isolated from the input circuit and coupled between said first and second load terminals to control application of load current from said A.C. power source to said load in response to the physical signal,
wherein said control circuit comprises
a transducer which receives said physical signal and transduces it into an electric signal,
a zero-cross firing circuit including a single transistor controlled in response to the instantaneous values of A.C. voltage at said first and second load terminals and in response to said electric signal from said transducer, and
a pair of thyristors connected in series and in opposite direction to each other and coupled across said first and second load terminals, said thyristors switching the positive part

and the negative part, respectively, of the load current from the A.C. power source to the load, the gates of both thyristors being commonly coupled to one of the collector and the emitter terminals of said single transistor, the other of the collector and emitter terminals of said single transistor being coupled to the anodes of both said thyristors.

---

**4,129,792**

## DRIVER BUFFER CIRCUIT USING DELAY INVERTERS

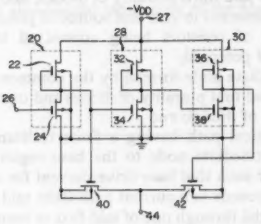
**Kenji Kawagai, and Shigeki Yoshida, both of Kawasaki, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan**

**Filed May 31, 1977, Ser. No. 802,136**

**Claims priority, application Japan, May 31, 1976, 51-63067**

**Int. Cl.[2] H03K** *17/60, 17/16, 4/48, 6/04*

**U.S. Cl. 307—270** **7 Claims**




1. A driver circuit which comprises an input terminal; first and second power terminals; a driver stage connected to said input terminal of the driver circuit; an inverter stage formed of an even number of mutually cascade connected inverters and connected to the output side of said driver stage; a first switching element formed of a first field effect transistor having a gate electrode connected to the output terminal of said driver stage and first and second output electrodes and rendered conducting or nonconducting according to a level of an output signal being received from said driver stage; a second switching element formed of a second field effect transistor having a gate electrode connected to the output terminal of said inverter stage and first and second output electrodes being connected to said first and second output electrodes, respectively, of said first switching element and rendered conducting or nonconducting according to a level of an output signal being received from said inverter stage; said first power terminal coupled to said first output electrodes and an output terminal coupled to said second output electrodes through which output signals from said first and second switching elements are drawn out.

---

**4,129,793**

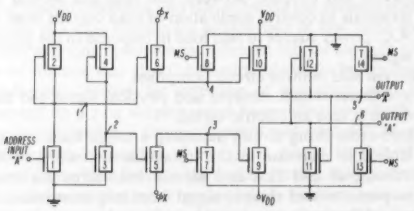
## HIGH SPEED TRUE/COMPLEMENT DRIVER

**John Bula, Rockville, Md., and Larry C. Martin, Manassas, Va., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jun. 16, 1977, Ser. No. 807,287**

**Int. Cl.[2] H03K** *17/60, 17/16, 19/40;* **G11C** *8/00*

**U.S. Cl. 307—270** **1 Claim**




1. A true/complement driver, comprising:

a phase splitting circuit comprising a first static mode inverter having its input connected to a signal source and connected in cascade configuration with a second static mode inverter;

a first clocked FET device having its source, drain path connected between a source of clock signals and a first gate node, and its gate connected to the output node of said second inverter;

a second clocked FET device having its source, drain circuit connected between said source of clock signals and a second gate node, and its gate connected to the output node of said first inverter;

a first DC voltage FET switch having its gate connected to said first gate node, its drain connected to a drain voltage, and its source connected to a first output node;

a second DC voltage FET switch having its gate connected to said second gate node, its drain connected to a drain voltage, and its source connected to a second output node;

a first latching FET having its drain connected to said first output node, its source connected to ground potential and its gate connected to said second output node;

a second latching FET having its drain connected to said second output node, its source connected to ground potential and its gate connected to said first output node;

whereby said clock signal source is isolated from said first and second output nodes and from said ground potential.

---

**4,129,794**

## ELECTRICAL INTEGRATED CIRCUIT CHIPS

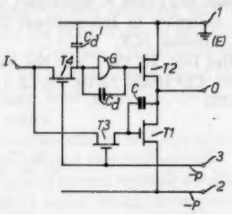
**John F. Dickson, and John D. Wilcock, both of Northampton, England, assignors to Plessey Handel und Investments AG, Zug, Switzerland**

**Filed Sep. 3, 1976, Ser. No. 720,235**

**Claims priority, application United Kingdom, Sep. 4, 1975, 36458/75; Nov. 22, 1975, 48099/75**

**Int. Cl.[2] H03K** *17/60, 17/10*

**U.S. Cl. 307—270** **12 Claims**



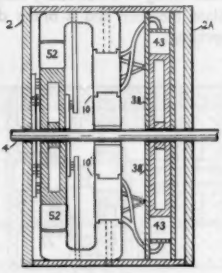

1. An electrical integrated circuit chip including a buffer amplifier comprising a first pair of power supply terminals for receiving a supply voltage thereacross having a first level of magnitude, first and second insulated gate field effect transistors of the same channel conductivity, said transistors having source, drain and control electrodes, and being connected in series between the first pair of power supply terminals with the source of the first transistor connected to the drain of the second transistor, output terminal means connected to the source of the first transistor, a second pair of power supply terminals for receiving a supply voltage thereacross of a magnitude different from that across said first pair of power supply terminals input means for receiving a two-level input signal having a potential difference of a magnitude less than that received across either of said pairs of supply terminals, said input means being connected between the second pair of power supply terminals and being connected for applying said two-level signal to the control electrodes of the first and second transistors in antiphase to one another and bootstrap capacitor means connected between the output terminal means and the control electrode of the first transistor.

4,129,795

# ELECTROMAGNETIC PISTON ENGINE

Thomas S. Miyada, P.O. Box 430, Summit, N.J. 07901

Filed Feb. 28, 1977, Ser. No. 773,422
Int. Cl.[2] H02K 7/06
U.S. Cl. 310—24 7 Claims




1. An electromagnetic piston engine for converting electromagnetic energies into mechanical movements, comprising, in unique and useful combinations,

(a) a substantially cylindrical casing having disklike radial walls with inlets and outlets for electric lines, cylindrical cage-like wall constructed of evenly spaced bars running axially, reinforcing ribs running circumferentially, and a central opening with roller bearings in each of the said radial walls;

(b) a main shaft running through said central opening of each of said radial walls;

(c) a plurality of evenly spaced permanent magnets, arranged in a circle and securely held to the inner surface of one of the said reinforcing ribs, and having their free polar ends pointing in the general direction of said shaft;

(d) stationary conducting rings consisting of comparatively large ring enclosing a slightly smaller ring without direct contact between them, both rings divided by insulating strips into even number of corresponding sectors, such that a diametral line drawn through a midsection of any sector of the inner ring will pass through the midsection of the corresponding sector of the larger ring,

(1) said conducting rings being mounted on the inner surface of the said radial wall and protected by proper insulation, and having their center aligned with the axis of said radial wall;

(2) said outer ring having its sectors marked + − + − . . . in a clockwise order, and the corresponding sectors of the inner ring marked with the symbols − + − + . . . in a clockwise order;

(3) said minus sectors of both rings connected to a conductor that carries electron current away from its source of supply, and said plus sectors of both rings connected to a conductor that carries current back to the same source of supply, thus making it possible for an electromagnet to change its polarity everytime its terminals brush over from "+ − " sectors to " − + " sectors, or vice versa, or said rings;

(e) a polarity wheel, designed for reversing the direction of electron current in electromagnetic poles and solenoids, comprising, in combination,

(1) a concentric disk having a central opening to receive the said main shaft, which is keyed thereto, and positioned close to the said stationary conducting rings;

(2) a plurality of evenly spaced electromagnetic poles securely attached to the periphery of said disk, and extending outwardly towards the polar ends of the permanent magnets described in section (c) above, but stopping short of touching the latter, each pole having windings of insulated conductors, one terminal of which attached to the closest conducting brush, and the other end to the next closest brush, and the other end to the next closest brush, said brushes being the ones described in subsection that follows;

(3) a plurality of conducting brushes arranged in pairs on the reverse side of the said wheel, each pair securely held in insulation, which in turn attached to the wheel's radial surface near the base of each pole, and the whole forming a circular pattern whose center aligning with that of the said wheel, said paired brushes extending axially to be in constant contact with the stationary conducting rings described in section "*d*" hereinabove, thus causing the polarity of the electromagnets to change periodically as the said brushes sweep over the said conducting rings;

(f) conducting rear radial rings consisting of an inner and an outer rings, the former in touch by means of brush to the conducting wire that carries current from its source of supply, and the latter in contact by means of brush to the line that carries current back to the same source of supply, said rings securely mounted on the reverse side of said polarity wheel, but insulated therefrom, and their center aligned with that of the said wheels;

(g) conducting front radial rings consisting of an inner and an outer rings, mounted on insulation and securely attached to the obverse surface of the said polarity wheel, the outer ring having its first 180° sector marked as the plus sector, and its second 180° sector as its minus sector, and the inner ring having its first 180° sector marked as its minus sector and its second 180° sector as its plus sector, said rings having their minus sectors interconnected by means of a conductor that goes through the said wheel and connected to the rear minus ring, and their plus sectors also interconnected by a separate wire that goes through the said wheel to be attached to the rear plus ring, said front rings, by virtue of their rotary contacts, permitting a direct current to flow into one terminal and out of the other terminal, or vice versa, of the solenoids in the circuit, thus reversing the latter's polarity at the same speed as the rotation of the polarity wheel;

(h) a configuration of magnetic sets, each set arranged in the shape of an oversized spoke, identified herein simply as spoke, radiating from a common hub and forming an overall appearance of a wagon wheel, comprising, in combination,

(1) a plurality of evenly spaced paired spokes having their lower ends merged and securely attached to a common hub that provides a passageway for the main shaft, each spoke consisting of an elongated permanent magnet whose one end starting from the said hub and whose other end coupled to the lower end of a solenoid, and the upper end of the solenoid, in turn, coupled to the lower end of a second permanent magnet whose upper elongated section being bent over the said polarity wheel to become a field pole of the wheel;

(2) a plurality of insulated windings on each of the said permanent magnets having terminals marked "+" and "−" and left unconnected by any source or energy, except in emergencies requiring reenergizing of said magnets;

(3) a plurality of insulated windings in each of the said solenoids, which constitute the middle sections of each spoke, the terminals of which in contact with the front conducting rings of the said polarity wheel;

(4) a number of pipelines originating and ending in the intermediate section of the said spoke and permitting the inflow and outflow of fluids;

(i) a plurality of pistons designed to pump fluids for operating a turbine and to be cooled by the flowing fluids in which they are immersed, each piston occupying a space inside a solenoid of each of the said spokes, and consisting of

(1) a solid cylindrical ferrous body with layers of insulated windings, all enclosed in

(2) a watertight nonmagnetic cylindrical container, and

(3) terminals from said windings passing through said

container to be in sliding contact with conductors that lead to and from the front rings of said polarity wheel, said pistons moving reciprocatingly or in pumping action with every reversal of its polarity by the rotation of the said polarity wheel;

(j) a turbine unit consisting of

(1) a cylindrical housing having a central opening and roller bearings supporting the main shaft, and inlets and outlets in its walls permitting fluids to enter and leave the same;

(2) a plurality of pipes communicating the interior of the solenoids and the turbine housing;

(3) a cylindrical turbine wheel, keyed to said main shaft, and occupying the said housing, and rotated by streams of fluid pumped by said pistons in said solenoids, and carried by said pipes;

(k) lubricating means.

---

**4,129,796**

## STATOR WINDING MOUNTING FOR AN ELECTRIC MOTOR

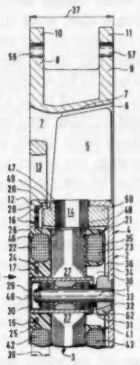
**Georg Papst, St. Georgen, Fed. Rep. of Germany, assignor to Papst-Motoren KG, St. Georgen, Fed. Rep. of Germany**

**Filed Dec. 12, 1975, Ser. No. 640,170**

**Claims priority, application Luxembourg, Dec. 13, 1974, 71477**

**Int. Cl.² H02K *1/04***

**U.S. Cl. 310—43** **14 Claims**



1. An electric motor whose rear stator winding ends are embedded in a casting of electrically insulating plastic which is hard at the operating temperature of the motor, which is mounted with a stable metal flanged plate coaxial to the motor axis and fixed to a metallic outer casing member, wherein the flanged plate for the rear winding ends is perforated and has a portion embedded in the casting and an outer edge which is connected with the casing member, said rear stator winding ends extending through the perforated flanged plate with an insulating clearance.

---

**4,129,797**

## BRAKE DEVICE FOR DRIVE MOTORS

**Adolf Lindner, Rottendorf, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany**

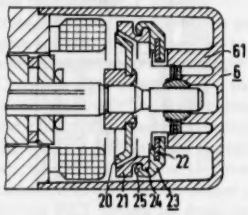
**Filed Jun. 23, 1977, Ser. No. 809,396**

**Claims priority, application Fed. Rep. of Germany, Jun. 30, 1976, 2629439**

**Int. Cl.² H02K *7/102***

**U.S. Cl. 310—77** **9 Claims**

1. In a brake for use with a drive motor, the brake comprising: a brake lining; a brake disk adpated to be spring-lifted electromagnetically by an axial displacement of the rotor of the motor against the force of a spring when the motor winding is energized and to come into contact by the force of the spring with said brake lining when the motor winding is deenergized; said brake lining and brake disk having mutual contact surfaces arranged in the manner of a conical brake at an oblique angle to the rotor displacement and the action line of the spring force; means adapted to connect at least resiliently in the radial direction said brake lining to a stationary member including an elastic intermediate member and a brake disk ring; the improvement comprising:



said brake lining having a formed-on bead-like rim;

said intermediate member being formed as a molded rubber member having a profile which bears a mating relationship to said rim;

said brake lining being held via said rim in said rubber member detentably and elastically in the radial and axial direction in the manner of a snap connection;

and said rubber member being connected firmly to said brake disk ring.

---

**4,129,798**

## PIEZO-RESISTIVE DEVICE FOR THE ELECTRICAL READ-OUT OF AN OPTICAL IMAGE

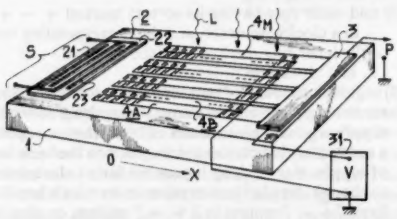
**Philippe Defranould, Paris, France, assignor to Thomson-CSF, Paris, France**

**Filed Apr. 12, 1977, Ser. No. 786,863**

**Claims priority, application France, Apr. 16, 1976, 76 11445**

**Int. Cl.² H01L *41/10***

**U.S. Cl. 310—313** **11 Claims**



1. A piezo-resistive device for the electrical read-out of an optical image, which comprises:

a piezo-resistive and photoconductive substrate;

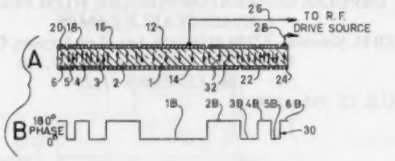
means for generating a pulse elastic wave of frequency F, propagating at the surface of the substrate;

a plurality of elementary detectors arranged in rows parallel to the direction of propagation of the elastic wave, on a surface of the substrate refered to as the interaction surface, on to which surface said image is projected, said elementary detectors each furnishing an electrical signal representing the local conductivity of said substrate due to the combined effect of said elastic wave, through the piezo-resistive effect, and of the optical energy of said image, through the photoconductive effect.

## 4,129,799
## PHASE REVERSAL ULTRASONIC ZONE PLATE TRANSDUCER

**Philip S. Green, Atherton, Calif., assignor to SRI International, Menlo Park, Calif.**

**Filed Dec. 24, 1975, Ser. No. 644,093**
**Int. Cl.[2] H01L *41/10***
**U.S. Cl. 310—359** **10 Claims**




1. An ultrasonic phase reversal zone plate focusing transducer comprising,

a transducer body of piezoelectric material uniformly polarized in a direction normal to opposite body surfaces,

a plurality of radially spaced concentric electrodes on the opposite body surfaces with electrodes on one surface overlapping portions of adjacent electrodes on the opposite surface, and

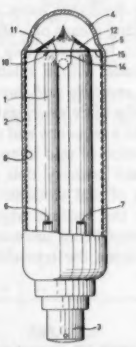
means for electrically connecting to inner and outer most electrodes for the provision of adjacent opposite phase active zones across the transducer body and transducer focusing.

---

## 4,129,800
## GAS AND/OR VAPOR DISCHARGE LAMP

**Willem Van Benthem, and Ernst M. Schmidt, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Oct. 27, 1977, Ser. No. 846,192**
**Claims priority, application Netherlands, Oct. 29, 1976, 7611991**
**Int. Cl.[2] H01J *61/30***
**U.S. Cl. 313—25** **4 Claims**



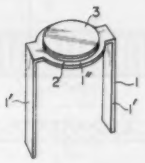

1. A gas and/or vapour discharge lamp which comprises an elongated discharge tube and an elongated outer bulb enveloping said discharge tube, means for supporting a portion of said discharge tube relative to the outer bulb which includes a sheet metal element, at least one local change in profile of at least the inside of said outer bulb, said sheet metal element including a ring shaped part, said ring shaped part cooperating with said local change in profile of at least the inside of said outer bulb, said ring shaped part being disposed generally transverse to the longitudinal directin of said outer bulb, said sheet metal element including a plurality of fingers extending from the plane of said ring metal part, a portion of said discharge tube passing through said sheet metal element and bearing against said fingers of said sheet metal element.

---

## 4,129,801
## CATHODE FOR CATHODE RAY TUBE OF DIRECTLY HEATING TYPE AND PROCESS FOR PRODUCING THE SAME CATHODE

**Ko Soeno, Hitachi; Tomio Iizuka, Ibaraki; Toshio Doi; Hisashi Ando, both of Hitachi; Testuo Oyama, Takahagi; Hiroshi Sakamoto, Hitachi, and Akira Misumi, Mobara, all of Japan, assignors to Hitachi, Ltd., Japan**

**Filed Jul. 6, 1977, Ser. No. 813,240**
**Claims priority, application Japan, Jul. 7, 1976, 51-79964**
**Int. Cl.[2] H01J *19/06, 9/04***
**U.S. Cl. 313—346 R** **29 Claims**



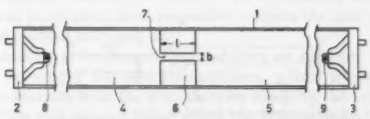

1. A cathode for cathode ray tube of directly heating type comprising a cathode substrate body having two leg pieces extended in the same direction and a flat part connected to one end of each leg piece, prepared by shaping a flat metal plate of nickel- or cobalt-based alloy; a bonding layer comprising heat-diffusible metals having an affinity to said flat metal plate, and having an uneven surface, formed on an outer surface of said flat part by diffusion bonding, to whose surface a thermionic emission layer is to be bonded, and the thermionic emission layer formed on the surface of the bonding layer, wherein an improvement comprises the bonding layer consisting of nickel and cobalt.

---

## 4,129,802
## LOW-PRESSURE MERCURY VAPOR DISCHARGE LAMP

**Louis E. Vrenken; Franciscus M. P. Oostvogels, and Rein W. van der Wolf, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Sep. 6, 1977, Ser. No. 830,650**
**Claims priority, application Netherlands, Sep. 14, 1976, 7610170**
**Int. Cl.[2] H01J *61/35, 61/42, 61/54***
**U.S. Cl. 313—492** **5 Claims**




1. A tubular low-pressure mercury vapor discharge lamp which comprises a discharge tube, first and second electrodes disposed within said discharge tube in spaced relationship, a light-transmissive conductive coating disposed on the interior of said discharge tube and not connected to either electrode, and a luminescent layer disposed on at least a portion of the inner surface of said discharge tube, said conductive coating consisting of at least two parts which are axially spaced and which each have a resistance per square between 400 and 4000 ohm, said parts being connected to each axially adjacent part by at least one electrical conductor having such a resistance

that the total series resistance of the entire conductive coating is between 5000 and 500,000 ohms.

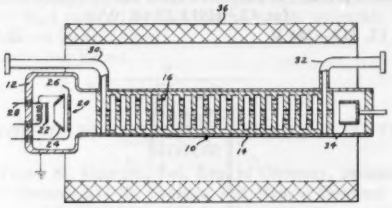
---

**4,129,803**

## TRAVELING WAVE DEVICE WITH CAST SLOW WAVE INTERACTION STRUCTURE AND METHOD FOR FORMING

**Walter Friz, Yellow Springs, Ohio, assignor to Louis E. Hay, Dayton, Ohio**

**Filed Apr. 5, 1977, Ser. No. 784,806**
**Int. Cl.² H01J *25/34***
**U.S. Cl. 315—3.5** **8 Claims**



1. A traveling wave device comprising:
(a) a body member;
(b) a metallic slow wave structure within the midsection of said body member, said slow wave structure including at least one casting formed in a mold having a chemically disposable core which is subsequently removed to leave at least a portion of the electrical passages through said slow wave structure;
(c) RF energy means joined to said slow wave structure for passing RF energy through said slow wave structure;
(d) means within said body member spaced from the first end of said slow wave structure for generating an electron beam interacting with the RF energy flowing through said slow wave structure;
(e) magnetic means encompassing said body member for producing a magnetic field for guiding said electron beam; and,
(f) collector means within said body member spaced from the second end of said slow wave structure for collecting the spent electron beam.

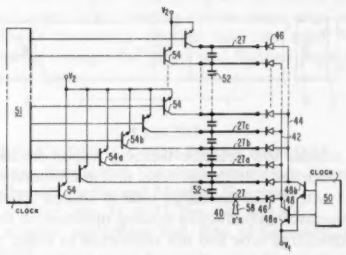
---

**4,129,804**

## IMAGE DISPLAY DEVICE COMMUTATOR

**Sherman Wiesbrod, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.**

**Filed Jun. 6, 1977, Ser. No. 804,003**
**Int. Cl.² H05B *37/00, 39/00, 41/00***
**U.S. Cl. 315—169 TV** **23 Claims**



1. An image display device commutator for biasing electrodes in the device comprising:
means for alternately switching a first electrical potential to one of at least two sets of alternate electrodes;
means for switching a second electrical potential to only one electrode in the other set of alternate electrodes; and
means for electrically isolating each electrode from the other electrodes in the same set when the second electrical potential is applied but not when the first electrical potential is applied.

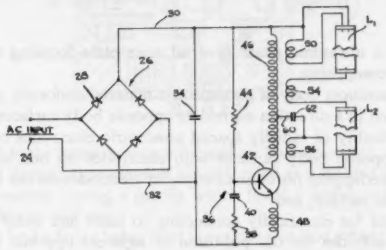
---

**4,129,805**

## IMPULSE GENERATOR FOR USE WITH PHOSPHOR ENERGIZABLE LAMPS

**Eli H. Sherman, 12554 Havelock Ave., Los Angeles, Calif. 90066**

**Filed Dec. 5, 1977, Ser. No. 857,220**
**Int. Cl.² H05B *41/29***
**U.S. Cl. 315—219** **47 Claims**




1. An impulse generator for use with a phosphor excitable lamp, said impulse generator comprising:
(a) means to receive electrical current,
(b) means operatively connected to said means to receive current for rectifying said electrical current,
(c) a solid-state switching element connected to receive the rectified current,
(d) primary coil means connected to at least one terminal of said switching element,
(e) secondary coil means located to be electromagnetically coupled with said primary coil means,
(f) terminal means on said secondary coil means for connection to a gaseous discharge lamp, and
(g) pulse control timing means operatively connected to said switching element for generating pulses of gradual increases in amplitude with a relatively short time peak amplitude rise to energize said lamp and which peak amplitude falls rapidly after energization of said lamp, said pulses occurring in a sequence and at intervals sufficient to maintain energization of said lamp, and which pulses are transmitted to said primary coil means and said lamp through coupling of said secondary coil means, the time interval between the leading edge of one pulse to the trailing edge thereof being substantially smaller than the time interval between the transmission of said pulses to said lamp.

---

**4,129,806**

## CORRECTION CIRCUIT FOR LOAD DEPENDENT RASTER DISTORTION

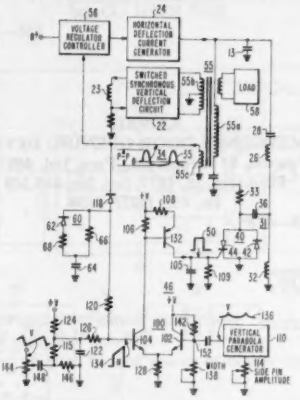
**Peter E. Haferl, Zurich, Switzerland, assignor to RCA Corporation, New York, N.Y.**

**Filed Sep. 6, 1977, Ser. No. 830,854**
**Claims priority, application United Kingdom, Apr. 14, 1977, 15545/77**
**Int. Cl.² H01J *29/56***
**U.S. Cl. 315—370** **14 Claims**

1. A raster correction arrangement for a television deflection apparatus, comprising:
a horizontal deflection current generator for producing deflection signals at the horizontal rate;
a horizontal deflection winding coupled to said horizontal

deflection current generator and responsive to said deflection signals to produce recurrent retrace pulses;

a load circuit coupled to an output of said horizontal deflection current generator for being energized thereby, variations in the load of said load circuit varying the duration of said retrace pulses in a manner to cause raster distortion;




retrace pulse duration sensing means coupled to said horizontal deflection current generator for generating a control signal representative of the duration of said retrace pulses; and

controllable impedance means coupled to an output of said horizontal deflection current generator and to said retrace pulse duration sensing means and responsive to said control signal for compensating said raster distortion.

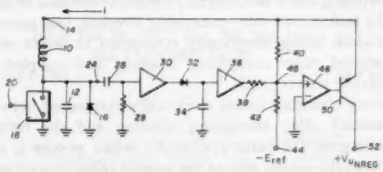
---

**4,129,807**

## CURRENT REGULATING CIRCUIT FOR MAGNETIC DEFLECTION SYSTEMS

**Carlo Infante, Dallas, Tex., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Oct. 15, 1976, Ser. No. 732,686**
**Int. Cl.² H01J** *29/70, 29/72*
**U.S. Cl. 315—387** **20 Claims**




1. A circuit for regulating the current through an inductor, comprising:

means responsive to the current in the inductor and generating a DC voltage varying therewith,

a voltage comparator receiving the DC voltage and including a reference voltage source, said comparator generating a control voltage varying with the difference between the DC voltage and the reference voltage, and

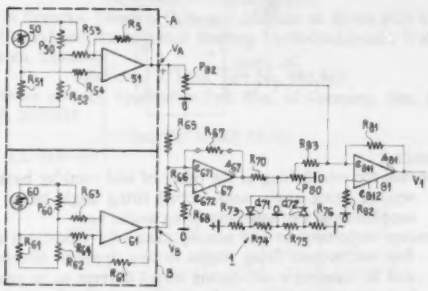
regulating means responsive to the control voltage and connected between a DC voltage source and the inductor to regulate the current through said inductor in accordance with the control voltage.

**4,129,808**

## ELECTRONIC CONTROL ARRANGEMENT WHICH CAN BE USED IN PARTICULAR FOR DRIVING A BRUSHLESS AND SLIP-RINGLESS MOTOR AND AN INSTALLATION INCORPORATING SUCH AN ARRANGEMENT

**Marc Bregeault; Jacques Lecoeuche, and Pierre Margrain, all of Colombes, France, assignors to Auxilec, Colombes, France**

**Filed Jun. 10, 1977, Ser. No. 805,453**
**Claims priority, application France, Jun. 15, 1976, 76 18124; Jan. 18, 1977, 77 01331**
**Int. Cl.² H02K** *29/00*
**U.S. Cl. 318—254** **11 Claims**




1. An electronic control arrangement which receives at its input a first DC control voltage $V_1$ which is formulated on the basis of at least one control parameter, and delivering at its output, from a source of DC electrical energy, two sinusoidal voltages of the same frequency and amplitude which are 90° out of phase and whose frequency varies as a function of the said first control voltage and whose amplitude is at all times held proportional to the said frequency, comprising:

a processing block which converts the said first DC control voltage $V_1$ into a second DC control voltage $V_2$. the curve of said second voltage $V_2$ rising linearly as a function of time;

a function generator which receives at its input the said second DC voltage $V_2$ and which produces at its output first and second sinusoidal voltages $V_{a1}$ and $V_{a2}$ which are of the same frequency and amplitude but which are 90° out of phase with one another, the frequency and amplitude of the said sinusoidal voltages being proportional to the said DC control voltage $V_2$;

first and second power amplifiers which contain first and second pre-amplifiers, respectively, which latter pre-amplifiers receive at their inputs the first and second sinusoidal voltages $V_{a1}$ and $V_{a2}$, respectively, and which cooperate with the said source of DC electrical energy so as to produce at their respective outputs the said sinusoidal control voltages; and

an auxiliary arrangement for producing an auxiliary voltage V to supply the said preamplifiers, which arrangement co-operates with the amplifiers by blocking the operation of the said pre-amplifiers when the voltage from the said source of DC electrical energy falls below a certain threshold.

---

**4,129,809**

## POWER FACTOR CORRECTED DUAL CONVERTER MOTOR DRIVE

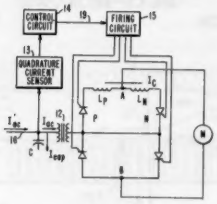
**John Rosa, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Apr. 28, 1977, Ser. No. 791,746**
**Int. Cl.² H02P** *7/00*
**U.S. Cl. 318—293** **6 Claims**

1. In a dual converter motor drive including at least two

semiconductor controlled rectifier banks connected between an alternating current power source and a reversible direct current motor, said rectifier banks being connected in reverse parallel connection between the terminals of said direct current motor, and means for establishing a first firing angle in one of said rectifier banks to control said direct current motor under predetermined torque and speed conditions in one of two opposite directions of rotation, the combination of:

means for sensing the lagging quadrature component of the total current drawn by said rectifier banks from said AC source;




means for establishing in the other of said rectifier banks a second firing angle, said second firing angle being the supplementary of said first firing angle; and

means responsive to said sensing means for modifying said first and second firing angles in two opposite directions and for causing a circulating direct current to be passed between said rectifier banks, the magnitude of said circulating direct current being in relation to a desired magnitude of said lagging quadrature component of current;

whereby the effect of said direct current motor on said sensed lagging quadrature current component is minimized.

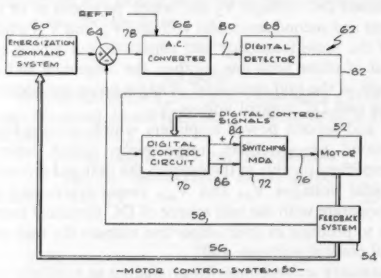
---

**4,129,810**

**SWITCHING MOTOR CONTROL SYSTEM**

**Robert P. Harshberger, Jr., San Jose, Calif., assignor to Ampex Corporation, Redwood City, Calif.**

**Filed May 3, 1976, Ser. No. 682,372**
**Int. Cl.[2] H02P *7/00***
**U.S. Cl. 318—317** **20 Claims**




1. A motor control system comprising:

a motor coupled to operate in response to a motor drive signal applied to the motor;

an energization command system generating an energization command signal commanding a magnitude of motor drive current;

a feedback system generating an actual energization signal indicative of actual motor drive current; and

a feedforward system coupled to receive the energization command signal and the actual energization signal and to energize the motor in accordance with a difference therebetween to tend to reduce the difference, the feedforward system including a switching motor drive amplifier coupled to drive the motor with a motor drive signal that switches at a constant frequency between at least two different states at a switching rate that is independent of motor velocity and faster than the cutoff frequency response to the motor to the applied motor drive signal.

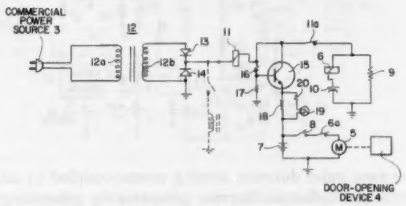
---

**4,129,811**

**EMERGENCY DOOR OPENING DEVICE**

**James E. Pearson, 81 Airport Rd., Peru, Ind. 46970**

**Filed Oct. 25, 1977, Ser. No. 845,269**
**Int. Cl.[2] H02P *1/04***
**U.S. Cl. 318—478** **1 Claim**




1. An emergency door-opening device for a structure housing animals and having a door, and an electrically energized ventilation system supplied with electrical energy from a commercial power source for ventilating the structure, said emergency door-opening device comprising

a door-opening device in operative proximity with the door of the structure for opening said door;

a motor coupled to the door-opening device for operating said door-opening device to open said door;

a first relay device having a first relay energizing winding and a first relay switch controlled in operation by said first relay energizing winding;

a motor control circuit comprising the first relay switch, the motor and a battery connected in series circuit arrangement;

a time delay circuit including the first relay energizing winding;

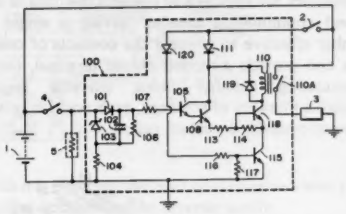
a second relay device having a second relay energizing winding and a second relay switch controlled in operation by said second relay energizing winding, said second relay switch being electrically connected in series with said second relay energizing winding and coupled to the power source; and

battery charging means electrically connected between the second relay energizing winding and the battery for charging the battery whereby when power is supplied from the power source the second relay energizing winding is energized, closes the second relay switch, charges the battery, and energizes the time delay circuit while keeping the first energizing winding unenergized to maintain the first relay switch open and the motor deenergized and the door-opening device inoperative and when the power fails the second relay energizing winding is deenergized, opens the second relay switch and causes the time delay circuit to energize the first relay energizing winding for a predetermined period of time after which said first relay energizing winding is deenergized and closes the first relay switch thereby causing the battery to energize the motor and operate the door-opening device to open the door.

## 4,129,812
## ELECTRONIC TIMER

Hiromichi Shigenobu, Toyota; Toshiaki Isobe, and Minoru Kondo, both of Nagoya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Kabushiki Kaisha Tokai Rika Denki Seisakusho, both of Aichi, Japan

Filed Aug. 23, 1976, Ser. No. 716,631
Claims priority, application Japan, Oct. 16, 1975, 50-125079
Int. Cl.[2] H02H *7/08*
U.S. Cl. 318—484 13 Claims

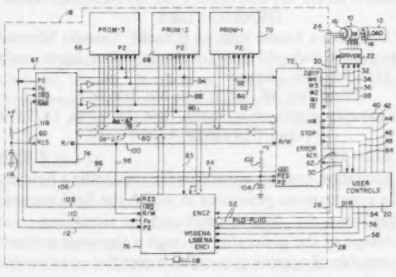


1. An electronic timer circuit comprising:
a source of electrical power;
a condenser coupled to said source of power for storing a charge;
a control switch means;
a load;
a controlled switch means for controlling the power to said load;
a high input impedance circuit for discharging said stored charge in said condenser at a predetermined rate and for causing said controlled switch means to allow power to be supplied to said load when said control switch means is closed and said charge stored in said condenser is greater than some predetermined amount; and
a switching component coupled to said high input impedance circuit which is actuated in response to said control switch means to reduce the discharge current through said switching components whenever said controlled switch means is opened and not allowing power to be supplied to said load.

## 4,129,813
## METHOD AND APPARATUS FOR ADAPTIVE CONTROL OF A STEPPER MOTOR

Barney D. Hunts, and John B. S. Waugh, both of Mountain Lakes, N.J., assignors to The Singer Company, New York, N.Y.

Filed Jul. 26, 1977, Ser. No. 819,188
Int. Cl.[2] G05B *13/00*
U.S. Cl. 318—561 38 Claims

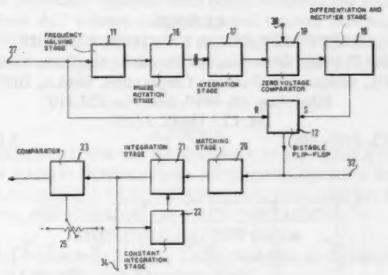


1. An adaptive control system for a stepper motor comprising:
a stepper motor;
electrical means coupled to said stepper motor for driving said stepper motor a predetermined number of steps;
said electrical means including means to temporarily decelerate said stepper motor during the time said stepper motor is being driven said predetermined number of steps; and
computing means coupled to said stepper motor for calculating the deceleration needed to bring said stepper motor to a stop at the end of said predetermined number of steps.

## 4,129,814
## PROCESS FOR THE FORMATION OF A COMPARISON SQUARE WAVE SIGNAL

Erwin Francke, Munich, Germany, assignor to Erwin Sick Gesellschaft mit beschränkter Haftung Optik-Elektronik, Waldkirch, Germany

Filed Jun. 3, 1976, Ser. No. 692,563
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1975, 2527375
Int. Cl.[2] G05B *19/36*
U.S. Cl. 318—577 8 Claims



1. A method for the formation of a comparison square wave signal having a reference edge in a curve control device in which a scanning head periodically transversely scans a line to be tracked and transmits a base comparison square wave signal and a measurement square wave signal whose phase position is a criterion for the divergence of the scanning head from the desired value, and is determined by comparison with the position of the base comparison square wave signal, whereby a follow-up signal is formed which is dependent on the direction of the divergence, comprising forming by frequency halving, integration and threshold means, needle pulses from the base comparison square wave signal produced by the scanning head, each successive pair of the needle pulses being completely symmetrical to the reference edge and wherein the comparison square wave signal is formed from the needle pulses and the reference edge.

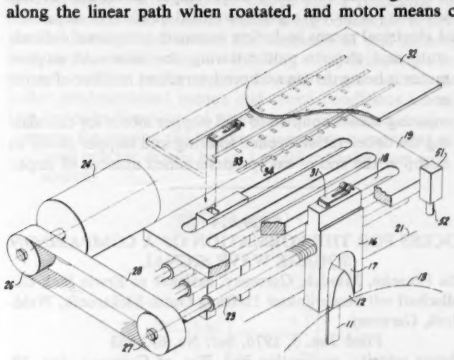
## 4,129,815
## POSTAL METER ACTUATOR

Jeffery C. Argentine, Santa Rosa, and Darrell B. Minton, Sebastopol, both of Calif., assignors to National Controls, Inc., Santa Rosa, Calif.

Filed Sep. 10, 1976, Ser. No. 721,983
Int. Cl.[2] G05B *19/28*
U.S. Cl. 318—601 9 Claims

1. In combination: a postage meter having a plurality of levers movable between positions spaced along a predetermined path for selecting different values of postage, and an actuator removably mounted on the postage meter for moving the postage setting levers, said actuator comprising individually movable drive shoes for engaging respective ones of the levers, means constraining the drive shoes for movement along a linear path generally parallel to the predetermined path, lead

screws connected to the drive shoes for moving the shoes along the linear path when roatated, and motor means con-



nected to the lead screws for rotating the screws to move the shoes.

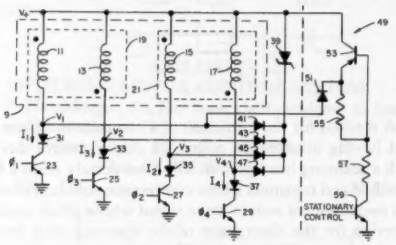
---

**4,129,816**

## STEPPING MOTOR CONTROL CIRCUIT

**Edmund C. Feldy, Evanston, and Dennis L. Stephens, Niles, both of Ill., assignors to Teletype Corporation, Skokie, Ill.**

**Filed Aug. 10, 1977, Ser. No. 823,310**
**Int. Cl.[2] H02K *37/00***
**U.S. Cl. 318—696** **5 Claims**



1. In combination with a stepping motor having a plurality of stator phase windings each being successively energized during rotary operation with at least a first one of the phase windings being energized over a predetermined time period with a pulsed current during stationary operation and means for dissipating the induced energy in at least said first winding upon de-energization, the improvement comprising:

means for selectively reducing the energy dissipated by said dissipating means during stationary operation to a lower value than during rotary operation so as to increase the average current through said first pulsed winding and thus the operational efficiency of the combination.

---

**4,129,817**

## STEPPED VOLTAGE POWER SUPPLY WITH EQUALIZED DISCHARGE OF BATTERY CELLS

**Ming-Chih Yew, Rochester, and Trevor O. Jones, Birmingham, both of Mich., assignors to General Motors Corporation, Detroit, Mich.**

**Filed Aug. 22, 1977, Ser. No. 826,372**
**Int. Cl.[2] H02J *7/00*; H02P *7/00***
**U.S. Cl. 320—18** **2 Claims**

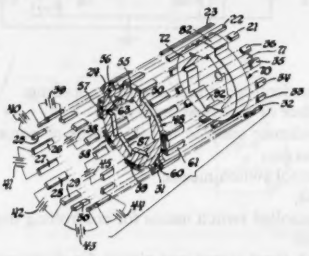
1. A stepped voltage electric power supply for a vehicle mounted electric motor, comprising, in combination:

a plurality of regularly spaced contact pairs;

a first commutating member having a plurality of regularly spaced contact members effective to connect the contacts of each pair but one, the commutating member being movable sequentially through a plurality of positions, each position providing a different unconnected contact pair, one of the contact members adjacent the unconnected contact pair providing a first output terminal;

a plurality of electric power cells, each cell being connected in a consistent polarity between the adjacent contacts of adjacent contact pairs and each contact pair being connected to its adjacent contact pairs on either side by such cells, whereby the contact members of the first commutating member are effective to connect the cells in series;

a second commutating member having a single contact member effective to connect the contacts of one of said pairs and provide a second output terminal, the second commutating member being movable sequentially through a plurality of positions, each position providing a different connected contact pair;



actuator means movable sequentially through a plurality of positions in a first, output voltage increasing direction and a second, opposite, output voltage decreasing direction;

drive means connecting the actuator to the first and second cummutating members, the drive means including unidirectional clutch means effective to move the first commutating member in one direction to increase the number of cells connected across the output terminals with movement of the actuator means in its first direction and to move the second commutating member in the same one direction to decrease the number of cells connected across the output terminals with movement of the actuator means in its second direction, whereby the specific cells connected across the output terminals are changed with movement of the actuator means in the first and second directions to equalize the discharge of the cells with use.

---

**4,129,818**

## EXCITATION CONTROL APPARATUS SUITED FOR NORMAL STOP OPERATION OF SYNCHRONOUS GENERATORS

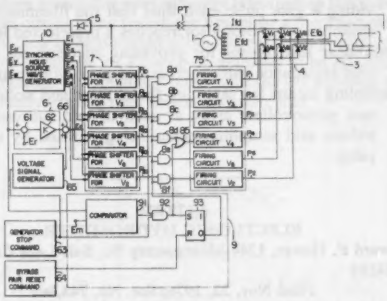
**Masuo Goto; Akira Isono, both of Hitachi; Yasushi Momochi, Hitachiota, and Takaaki Kai, Tokaimura, all of Japan, assignors to Hitachi, Ltd., Japan**

**Filed Jun. 15, 1977, Ser. No. 806,862**
**Claims priority, application Japan, Jun. 18, 1976, 51/71191**
**Int. Cl.[2] H02P *3/06***
**U.S. Cl. 322—10** **8 Claims**

1. An excitation control apparatus for controlling field excitation of a synchronous generator in which the field excitation is achieved by a d.c. output produced by rectifying an a.c. output voltage of the generator through a thyristor converter which is capable of operating as either a rectifier or an inverter, said apparatus comprising:

(a) first means for changing the operation of said converter to an inverter mode operation in response to a command for stopping operation of said generator, and

(b) second means for establishing a short-circuit in said converter immediately upon detecting a condition at



which it is expected that said converter becomes incapable of being operated in the inverter mode.

---

**4,129,819**

## VOLTAGE REGULATOR CIRCUIT FOR MOTOR VEHICLE GENERATOR WITH FEEDBACK TO OPPOSE REGULATOR TRANSIENTS

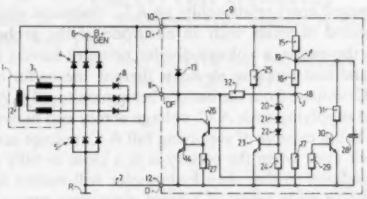
**Armin Arendt, Munich, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany**

**Filed Sep. 29, 1977, Ser. No. 837,990**

**Claims priority, application Fed. Rep. of Germany, Oct. 29, 1976, 2649306**

**Int. Cl.² H02P *9/38***

**U.S. Cl. 322—28** **9 Claims**



1. A voltage regulator for a generator having an exciter field winding (2) connected in series with a semiconductor switch (14) controllable through a Zener diode (20) by the voltage at a first tap (18) of a voltage divider (15, 16, 17) connected across the voltage to be regulated, in which regulator there is also provided: an inverse feedback path (28, 29, 30, 31) having a delayed operation characteristic and connected between the connection of the semiconductor switch (14) to said exciter field winding (2) and a second tap (19) of said voltage divider.

---

**4,129,820**

## VARIABLE REACTANCE TRANSFORMER

**Elwood M. Brock, Bradenton, Fla., assignor to Hunterdon Transformer Company, Flemington, N.J.**

**Filed Sep. 30, 1977, Ser. No. 838,185**

**Int. Cl.² H01F *21/08*; G05F *1/32***

**U.S. Cl. 323—56** **6 Claims**

1. An improved saturable reactance transformer comprising:

an annular main core;

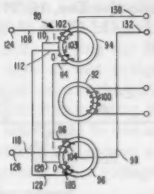
first and second auxiliary cores adjacent and coaxial with said main core;

first and second toroidal control windings on each of said auxiliary cores, the first control winding being toroidally wound on and electrically insulated from its core and the second control winding being toroidally wound over said first control winding;

a secondary winding toroidally wound only on said main core;

a primary winding having a first start lead and a first finish lead, said winding being toroidally wound over said main and auxiliary cores and their respective secondary and control windings; and

means cross-connecting said control windings in series opposition between a second start lead and a second finish



lead; said windings and cross-connections being so arranged that said first and second start leads are physically adjacent each other and said first and second finish leads are physically adjacent each other, whereby the instantaneous AC voltage induced in said control windings by alternating current applied to said primary windings and the AC voltage across said primary windings are subtractive.

---

**4,129,821**

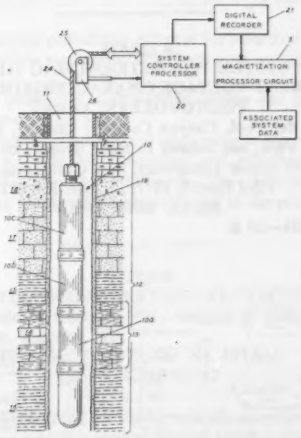
## DETERMINATION OF REMANENT MAGNETIZATION OF AN EARTH FORMATION PENETRATED BY A BORE HOLE USING A MAGNETOMETER-FOLLOWED BY PROCESSING OF DATA INCLUDING MICROPULSATION DATA

**Harold D. Messner, Vallejo, Calif., assignor to Chevron Research Company, San Francisco, Calif.**

**Filed Sep. 5, 1974, Ser. No. 498,359**

**Int. Cl.² G01V *3/00, 3/18***

**U.S. Cl. 324—8** **5 Claims**




1. Apparatus for migrating time variations (micropulsations) of an earth's magnetic field waveform collected at a datum line to become associated with a series of depth locations in a well bore penetrating an earth formation comprising:

(a) memory means for storing said waveform as binary data,

(b) means for digital filtering said binary data according to frequency characteristics of said data and including associated means for migrating said filtered data to said series of depth points as a function of conductivity of the intervening earth formation, and

(c) means for storing said filtered and migrated data as a function of depth within said earth formation.

---

**4,129,822**

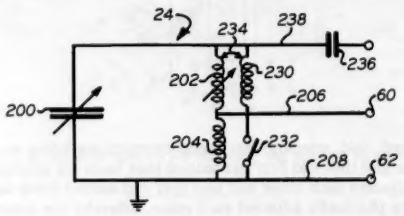
## WIDE-BAND NUCLEAR MAGNETIC RESONANCE SPECTROMETER

**Daniel D. Traficante, 16 Fairbanks Rd., Lexington, Mass. 02173**

**Continuation-in-part of Ser. No. 571,433, Apr. 24, 1975, Pat. No. 4,075,552. This application Dec. 16, 1977, Ser. No. 861,169**

**Int. Cl.[2] G01R *33/08***

**U.S. Cl. 324—0.5 AH** **13 Claims**




1. In a wide-band nuclear magnetic resonance spectrometer for determining the NMR frequency of a sample in an external magnetic field, a system comprising transmitting means for generating a signal having a frequency equal to the NMR frequency of the sample, receiving means for receiving the signal from the sample, and probe means for applying said signal from said transmitting means to the sample and for applying the signal from said sample to said receiving means, said probe means comprising serially connected coils connected across a capacitor to form a tank circuit resonant at the NMR frequency of the sample, one of said coils adapted to be inductively coupled to said sample for detecting the signal of NMR frequency from the sample, and another of said coils being inductively isolated from said one coil for applying the signal from the sample to said receiving means.

---

**4,129,823**

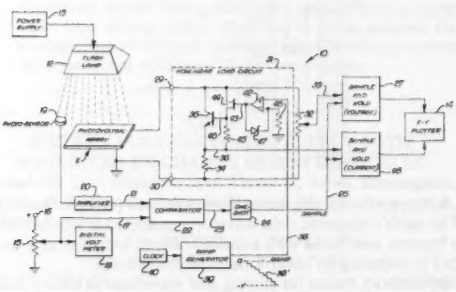
## SYSTEM FOR DETERMINING THE CURRENT-VOLTAGE CHARACTERISTICS OF A PHOTOVOLTAIC ARRAY

**Kees van der Pool, Canyon Country; Louis S. Rosinski, Jr., Canoga Park, and Johann B. Belli, Sylmar, all of Calif., assignors to Sensor Technology, Inc., Chatsworth, Calif.**

**Filed Nov. 3, 1977, Ser. No. 848,081**

**Int. Cl.[2] G01R *31/024***

**U.S. Cl. 324—20 R** **9 Claims**



1. A system for determining the current-voltage characteristics of a photovoltaic array, comprising:

a flash lamp mounted to illuminate said photovoltaic array at a pulsed rate,

a separate photosensor also mounted so as to be illuminated by said pulsed flash lamp,

comparator means, connected to said photosensor, for providing a gate pulse each time that the illumination level striking said photosensor reaches a preselected level,

nonlinear load means for providing successively different load impedance values across said photovoltaic array, and

sampling means for sampling the current and voltage from said photovoltaic array at each of said successive load values, said sampling means being enabled by said gate pulse.

---

**4,129,824**

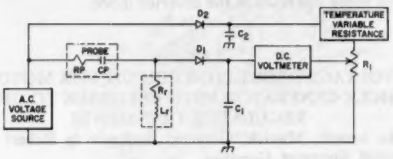
## ELECTRONIC HYDROMETER

**Edward P. Howes, 1244 Montgomery St., Salt Lake City, Utah 84104**

**Filed Nov. 22, 1976, Ser. No. 743,861**

**Int. Cl.[2] G01N *27/42***

**U.S. Cl. 324—29.5** **23 Claims**




1. An electronic hydrometer for continuously monitoring during use of a lead acid battery the amount of charge remaining in the battery by monitoring the specific gravity of the acid solution in the battery, comprising a probe for insertion into the battery solution to be monitored, said probe having electrodes in spaced apart relationship; an A.C. resistance electrically connected in series with an electrode of the probe to form, with the probe, a voltage divider network having said resistance and said probe as elements thereof; means for converting D.C. voltage from the battery being monitored to A.C. voltage and supplying such A.C. voltage across said network, said means being capable of supplying full A.C. voltage across said network even when the battery is in a close to fully discharged condition so that they hydrometer will remain fully powered over a wide range of battery conditions; means for generating a reference voltage; and means for comparing the A.C. voltage across one of the elements of the voltage divider network with the reference voltage, whereby voltage difference is indicated and is calibrated in terms of the amount of charge remaining in the battery being monitored.

---

**4,129,825**

## ELECTRICAL CONDUCTOR AND SHORT CIRCUIT LOCATOR

**Paul E. Brinegar, 1731 Springlake Dr., Fort Worth, Tex. 76012**

**Continuation-in-part of Ser. No. 551,816, Feb. 21, 1975, Pat. No. 4,021,730. This application May 2, 1977, Ser. No. 792,923**

**Int. Cl.[2] G01R *31/08, 31/02***

**U.S. Cl. 324—52** **8 Claims**

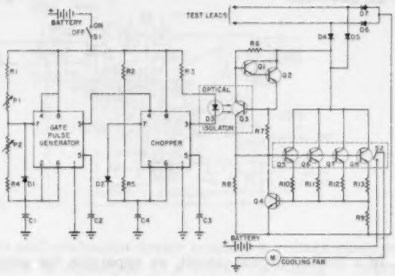
1. An apparatus for locating electrical conductors and short circuits comprising:

first and second test leads for connecting across open circuit breaker means in a circuit to be tested; the open circuit breaker means having a voltage potential across its terminals due to a circuit power source;

current limiting means connected across the test leads for allowing current due to the circuit power source to flow through the current limiting means and the circuit, and for limiting the current in the circuit being tested to a predetermined value to prevent excessive short circuit current in the circuit being tested; the predetermined value being sufficiently high such that pulsated and alternated cur-

rents are discernable at conducting points in the circuit by a clamp-on ammeter;

first pulse generating means, cooperating with the current limiting means, for intermittently interrupting the current in the circuit being tested; the first pulse generating means providing an on duration of the current in the circuit being tested sufficient for a clamp-on ammeter in an AC circuit to indicate a momentary pulse with the off duration substantially greater than the on duration; and



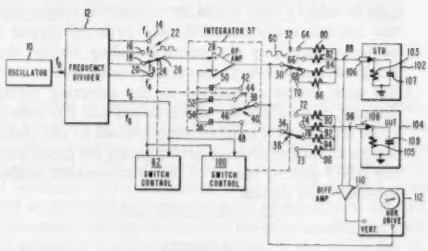

second pulse generating means, cooperating with the current limiting means and connected in series with the first pulse generating means, for interrupting the momentary pulse created by the first pulse generating means to provide a pulsating component in the momentary pulse so that a current reading is visible on a clamp-on ammeter in a DC circuit at all points along the circuit except at the short circuit.

---

## 4,129,826
## CIRCUIT TEST APPARATUS

**Chester R. Mills, Woodbury, N.J., assignor to RCA Corporation, New York, N.Y.**

**Filed Aug. 24, 1977, Ser. No. 827,241**
**Int. Cl.[2] G01R *27/00***
**U.S. Cl. 324—57 SS** **8 Claims**




1. Apparatus for testing a circuit which is intended to be substantially identical to a reference circuit comprising, in combination:

means for generating a periodic test waveform each period of which comprises a signal which varies through the same range of frequencies and at an impedance level which changes as the frequency changes and which is proportional to the frequency;

means for applying the test waveform both to the reference circuit and the circuit under test;

means for comparing the voltages developed at corresponding test points in the reference circuit and the circuit under test in response to said test waveform; and

means for indicating the difference between said voltages.

5. A test circuit comprising:

first, second, third and fourth nodes;

a bridge comprising a first arm connected between the first and second nodes, and a fourth arm connected between the fourth and first nodes, said first and fourth arms comprising resistive arms of equal value;

said second and third nodes serving as points between which a unit under test (UUT) may be connected, said UUT, when in place, serving as a second arm of said bridge;

said third and fourth nodes serving as points between which a standard unit (STD) may be connected, said STD, when in place, serving as the third arm of said bridge;

means for applying a periodic test signal between said first and third nodes which varies in frequency, during each period of said signal, over a range of frequencies;

means for concurrently varying the resistance of said first and said fourth arms of said bridge in correspondence with and in the same sense as the variation in frequency of said test signal, while maintaining the resistance of said first and second arms equal to one another; and

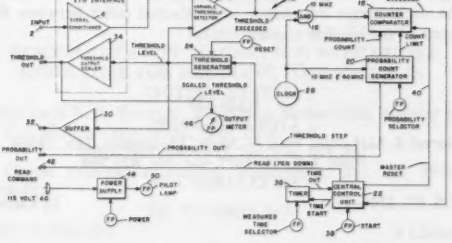
means coupled between said second and said fourth nodes for sensing any differences in voltage between said nodes.

---

## 4,129,827
## AMPLITUDE PROBABILITY DETECTOR

**Roger A. Southwick, 8502 E. Mabel Pl., Tucson, Ariz. 85715**

**Filed May 20, 1976, Ser. No. 688,441**
**Int. Cl.[2] G01R *23/16***
**U.S. Cl. 324—77 A** **9 Claims**




1. An amplitude probability detector for selectively measuring the amplitude probability distribution of an input signal, comprising:

means for presetting a probability within the probability distribution range; and,

means operably connected and responsive to the probability presetting means for generating and adjusting a signal threshold level such that the probability of the input signal exceeding the threshold level is equal to the preset probability.

---

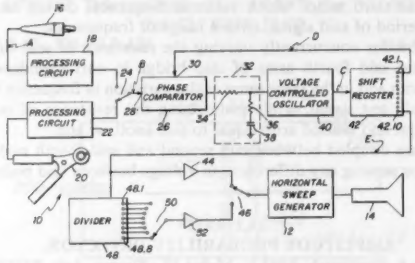
## 4,129,828
## OSCILLOSCOPE PRETRIGGER CIRCUIT

**James A. Jindrick, Kenosha, Wis., assignor to Snap-On Tools Corporation, Kenosha, Wis.**

**Filed Sep. 28, 1977, Ser. No. 837,636**
**Int. Cl.[2] G01R *13/42***
**U.S. Cl. 324—16 S** **9 Claims**

1. A pretrigger circuit for the horizontal-sweep generator of an oscilloscope which is used to display ignition signals of an internal combustion engine, said trigger circuit comprising phase-comparator means having first and second inputs and an output, said first input being connected to receive the ignition signals, said phase-comparator means generating a control voltage representative of the difference in phase and frequency of two signals respectively applied to said first and second inputs, voltage-controlled oscillator means coupled to the output of said phase-comparator means for producing a sequence of oscillator pulses at a frequency within a range of frequencies generally centered at N times the frequency of the

ignition signals, the frequency of the oscillator pulses being controlled by the value of said control voltage, and shift-register means having an input coupled to said voltage-controlled oscillator means and N shift-register outputs, one of said shift-register outputs being coupled to said second input of said phase-comparator means and another of said shift-register outputs being coupled to the horizontal-sweep generator, the sequence of oscillator pulses respectively causing said shift-




register means to generate output pulses sequentially on said shift-register outputs, whereby the output pulses on said one shift-register output are at the same frequency as said ignition and are in phase therewith, and the output pulses on said other shift-register output are at the same frequency as said ignition signals but not in phase therewith so that horizontal sweeps of the oscilloscope commence at a selected point between the starts of the ignition signals.

---

**4,129,829**

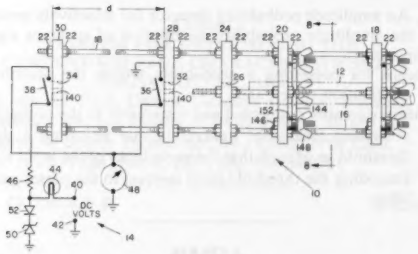
## CHRONOGRAPH

**Norvel J. McLellan, 1002 N. Main, Pleasanton, Tex. 78064**

**Filed Aug. 18, 1977, Ser. No. 825,769**

**Int. Cl.[2] G01P *3/66***

**U.S. Cl. 324—178** **12 Claims**



1. An apparatus for measuring velocity of a projectile comprising:

start switch means with a first side connected to ground;

stop switch means connected to a second side of said first switch means and a source of power;

current limiting means inserted between said stop switch means and said source of power;

regulating means across said source of power for regulation thereof;

meter means having a ballistic movement therein, said meter means being connected between said connection of said start and stop switch means and ground;

said projectile first opening said start switch means to begin current flow through said meter means, subsequently said projectile traveling a predetermined distance to open said stop switch means to stop current flow through said meter means, said meter means being calibrated in velocity units.

**4,129,830**

## COUNTING PROCESS FOR TIME-TO-DIGITAL CONVERTING CIRCUITS

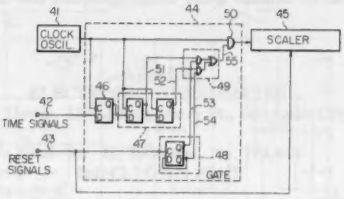
**Setsuro Kinbara, Mito, Japan, assignor to Japan Atomic Energy Research Institute, Tokyo, Japan**

**Filed May 25, 1977, Ser. No. 800,474**

**Claims priority, application Japan, Jun. 28, 1976, 51-76148; Sep. 7, 1976, 51-106263**

**Int. Cl.[2] G04F *8/00***

**U.S. Cl. 324—186** **2 Claims**




1. In a time-to-digital circuit, an apparatus for counting a pulse train obtained by gating clock-pulses by means of time signals to obtain digital values comprising:

a synchronizing circuit connected to a terminal of time signals for synchronizing the phases of said clock-pulses with the phases of said time signals,

a shift scaling circuit having a plurality of stages, including a binary coded unit, connected to the synchronizing circuit for shifting the time signals applied to the shift scaling circuit in accordance with the period of the clock pulses to obtain outputs from every stage of the shift scaling circuit,

a control scaling circuit having the same number of ordered outputs as the number of outputs of said shift scaling circuit and connected to a terminal of reset signals,

a plurality of selecting gates, each selecting gate having the same number of stages as those in the shift scaling circuit and connected to the shift scaling circuit and the control scaling circuit for applying one of the outputs obtained from the stages of the shift scaling circuit to the selecting gate to select a time signal by an ordered output signal of the control scaling circuit, said ordered output signal being provided by the control scaling circuit through being advanced every converting cycle, and

AND gate means connected to the selecting circuit for directly controlling the clock-pulses and for obtaining a pulse train with a number proportional to the number of the period of the time signals by gating the clock-pulses by the AND gate by means of the synchronized, shifted and selected time signals.

---

**4,129,831**

## CIRCUIT ARRANGEMENT FOR DETERMINING AND ANALYZING THE PHASE INTERFERENCE-MODULATION OF A MEASURING SIGNAL

**Helmuth Fink, Munich, and Guenter Wess, Seefeld, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany**

**Filed Aug. 4, 1977, Ser. No. 821,838**

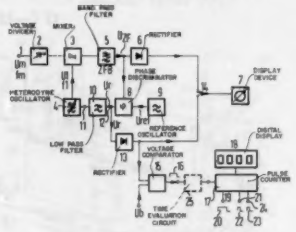
**Claims priority, application Fed. Rep. of Germany, Sep. 30, 1976, 2644159**

**Int. Cl.[2] G01R *27/00***

**U.S. Cl. 324—57 H** **7 Claims**

1. Circuit arrangement for determining the phase interference modulation of a measuring signal which is obtained via an object to be measured in the carrier-frequency band, employing a selective carrier-frequency heterodyne receiver, wherein the output voltage of a phase discriminator arranged in an automatic fine tuning circuit of the carrier-frequency heterodyne receiver and producing a voltage which regulates the

frequency of a heterodyne oscillator depending upon the phase difference between the measuring signal which has been converted into an intermediate frequency band and a reference voltage obtained from a reference oscillator, the output of said phase discriminator serving as a measurement for the phase interference modulation which is applied to an evaluation device, comprising the improvement in the combination



wherein said evaluation device contains a voltage comparator (15) which is connected to a source delivering a reference voltage (Ub), and emits an output signal (16) during the time the reference voltage (Ub) is exceeded by the output voltage (Ur) of the phase discriminator (8), and a pulse counter (17) connected to said voltage comparator (15) which counts the occurrrences of the output signals (16).

---

**4,129,832**

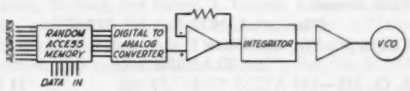
## METHOD AND MEANS FOR LINEARIZING A VOLTAGE CONTROLLED OSCILLATOR SWEEP GENERATOR

**Gary W. Neal, Melbourne, and Robert M. Montgomery, Indialantic, both of Fla., assignors to Harris Corporation, Melbourne, Fla.**

**Filed Jun. 20, 1977, Ser. No. 808,029**

**Int. Cl.[2] H03B *23/00***

**U.S. Cl. 331—44** **9 Claims**




4. A method of linearizing a voltage-controlled oscillator wherein a control signal is shaped into ramp form by a random access digital memory, converted to analog form, integrated and transmitted to the control input terminal of a voltage-controlled oscillator to be linearized whereby the control signal received at the oscillator control input terminal is of continuously increasing voltage in time and thereby causing the oscillator to generate a chirp; nonlinearities in the chirp are detected; and the memory is reprogrammed so as to diminish the detected non-linearities by reshaping the ramp control signal.

---

**4,129,833**

## MULTIVIBRATOR

**Toshiji Shibata, Toride, Japan, assignor to Meisei Electric Co. Ltd., Tokyo, Japan**

**Continuation of Ser. No. 707,076, Jul. 20, 1976, abandoned. This application Aug. 12, 1977, Ser. No. 826,272**

**Claims priority, application Japan, Jul. 31, 1975, 50/93635**

**Int. Cl.[2] G01K *7/16***

**U.S. Cl. 331—66** **16 Claims**

1. A multivibrator comprising:

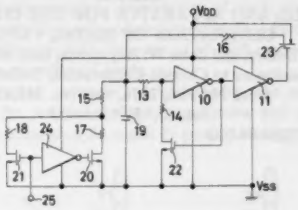
an inverter having input and output terminals;

a charging circuit having a first switch, a resistor $R_4$ and a condenser connected in series to a D.C. power source, said first switch having a control terminal;

a circuit connected in parallel to said condenser and having a resistor $R_1$, a resistor $R_2$ and a second switch connected in series, said second switch having a control terminal;

a discharging circuit connected in parallel to said condenser and having a resistor $R_3$ and a resistor selected from resistors $R_{X1}$ and $R_{X2}$ connected in series:

means for connecting the junction point of the resistor $R_1$ and the resistor $R_2$ to the input terminal of said inverter; and




means for connecting the output terminal of said inverter to the control terminal of said second switch and to the control terminal of said first switch, respectively;

wherein the time constant of said charging circuit being smaller than that of said discharging circuit, the resistance value of the resistor $R_4$ of said charging circuit being smaller than the sum of the resistance values of the resistors $R_1$ and $R_2$ of said circuit.

---

**4,129,834**

## RESONANT CAVITY MAGNETRON WITH CHOKE STRUCTURE FOR REDUCING HARMONICS IN OUTPUT SYSTEM

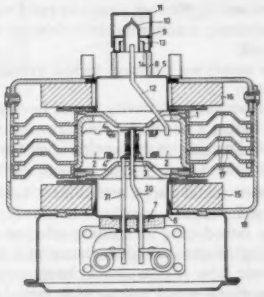
**Franciscus N. A. Kerstens, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Nov. 14, 1977, Ser. No. 851,280**

**Claims priority, application Netherlands, Jan. 17, 1977, 7700417**

**Int. Cl.[2] H03B *9/10***

**U.S. Cl. 331—91** **4 Claims**



1. A resonant cavity magnetron comprising an anode housing having an aperture in one side thereof and a plurality of anode vanes extending from the inner wall of said housing, an output portion including a probe connected to at least one of said vanes and extending through said aperture beyond said housing and a $\frac{1}{4}$ $\lambda$ folded choke for suppression of a higher harmonic of the fundamental frequency of oscillation of the magnetron spaced from said housing, said folded choke including a first generally cylindrical conductor connected to an end portion of said probe extending beyond said housing, a second tubular conductor coaxial with and surrounding said first conductor with a gap therebetween, the end of said second conductor remote from said housing being connected to said first conductor to define a first choke section, and a third

tubular conductor coaxial with said first conductor disposed between said first and second conductors, the end of said third conductor adjacent said housing being connected to one of said first and second conductors to define a second choke section, said first and second choke sections forming said folded ¼ λ choke.

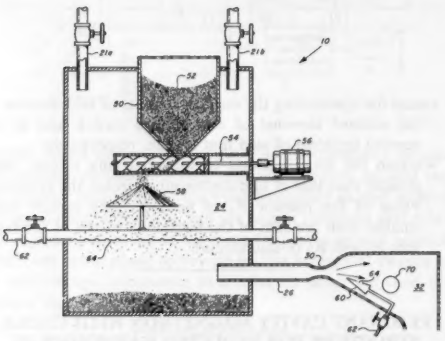
---

**4,129,835**

## METHOD AND APPARATUS FOR THE CONTINUOUS GENERATION OF METAL VAPOR

**John W. Daiber, and John W. Raymonda, both of Williamsville, N.Y., assignors to Calspan Corporation, Buffalo, N.Y.**

**Filed Nov. 26, 1976, Ser. No. 745,155**
**Int. Cl.² H01S *3/095***
**U.S. Cl. 331—94.5 G** **6 Claims**



5. Apparatus for continuously generating metal vapor to produce lasing by vapor phase combustion of metal atoms including:

precombustion chamber means for producing metal vapor;

means for supplying an excess of metal in the refined state to said precombustion chamber means;

means for supplying an oxidant selected from the group consisting of nitrous oxide, ozone and fluorine to said precombustion chamber means to react with said metal in an exothermic reaction whereby excess metal present is vaporized;

means for supplying a diluent to said precombustion chamber means;

optically resonant laser cavity means having an optical axis;

means including a nozzle for withdrawing metal vapor and diluent from said precombustion chamber means, expanding the flow to supersonic speeds and delivering said withdrawn metal vapor and diluent to said laser cavity means at supersonic speeds;

means for introducing an oxidant selected from the group consisting of nitrous oxide, ozone and fluorine into the supersonic flow region of said laser cavity means where the vaporized metal reacts with introduced oxidant to produce suitable excited molecules and thereby lasing.

---

**4,129,836**

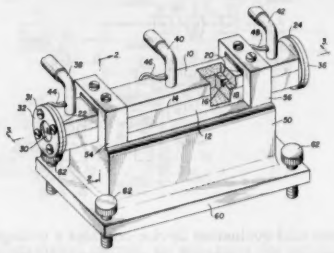
## FREQUENCY STABLE BORON NITRIDE CHANNEL LASER

**Aristotle Papayoanou, Eatontown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Apr. 4, 1977, Ser. No. 784,084**
**Int. Cl.² H01S *3/03***
**U.S. Cl. 331—94.5 D** **9 Claims**

1. A tunable high pressure molecular laser comprised of an elongated dielectric waveguide laser cavity of relatively small cross sectional area relative to its length, terminated at each end by a respective end mirror, a laser medium comprising a gaseous mixture, and means to excite said medium to provide laser action;

wherein said laser cavity comprises a channel formed in a block of boron nitride ceramic material which has high thermal conductivity and low thermal expansion, with the channel being the full length of said block and having cross sectional dimensions which are a very small fraction of the corresponding dimensions of said block;



cooling means providing a reservoir for removing heat from said block, which in conjunction with the good thermal conductivity of the boron nitride, acts to maintain the laser at an efficient, low operating temperature;

the construction means and the boron nitride thermal expansion properties being such that the change in mirror separation distance is very small and therefore the Fabry Perot resonance frequency is sufficiently stable to substantially eliminate line jumps.

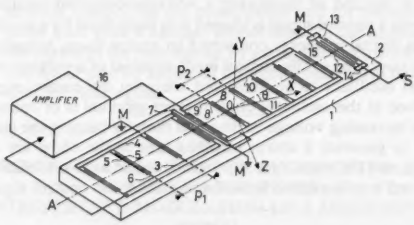
---

**4,129,837**

## ELASTIC SURFACE WAVE OSCILLATOR

**Pierre Hartemann, Paris, France, assignor to Thomson-CSF, Paris, France**

**Filed Jul. 5, 1977, Ser. No. 812,472**
**Claims priority, application France, Jul. 9, 1976, 76 21104**
**Int. Cl.² H03B *5/32***
**U.S. Cl. 331—107 A** **11 Claims**

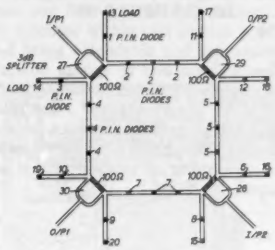



1. An elastic surface wave oscillator comprising: electrical amplifier means provided with a feedback loop, said feedback loop being formed by first and second interdigitated comb transducers arranged on a major face of a piezoelectric substrate; the electrical energy supplied by said oscillator being available at the terminals of a third interdigitated comb transducer arranged on said major face for collecting a fraction of the vibratory energy emitted by said second transducer; the interdigitated combs of said first and second transducers having fingers arranged for respectively forming arrays of discrete radiator elements; the pitches of said radiator elements in said arrays being respectively equal to $k_1$ and $k_2$ times the wavelength of said vibratory energy; $k_1$ and $k_2$ being integers respectively equal to 5 and 7.

## 4,129,838
## SWITCHING ARRANGEMENTS

John R. Wallington, London, and Robert B. Greed, Colchester, both of England, assignors to The Marconi Company Limited, Chelmsford, England

Filed May 13, 1977, Ser. No. 796,750
Claims priority, application United Kingdom, May 15, 1976, 20137/76
Int. Cl.[2] H01P 1/15
U.S. Cl. 333—7 D 14 Claims



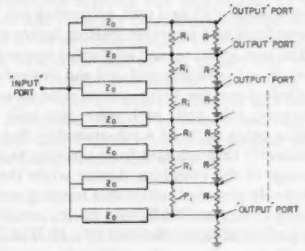

1. A switching arrangement including a switching device having four microstrips serially interconnected to form a closed loop with a port being provided at the junction between each two adjacent microstrips, and a 3dB splitter at two alternate ports in the loop, each microstrip including a variable impedance P.I.N. diode positioned at intervals $n\lambda/4$, n being an odd integer, from a port and each of the two 3dB splitters being provided with two selectable matched loads which are coupled to respective ones of the two microstrips which are interconnected at that 3dB splitter.

---

## 4,129,839
## RADIO FREQUENCY ENERGY COMBINER OR DIVIDER

Zvi Galani, Bedford, and Steven J. Temple, Arlington, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation-in-part of Ser. No. 775,801, Mar. 9, 1977, abandoned. This application Jun. 20, 1977, Ser. No. 807,859
Int. Cl.[2] H01P 5/12
U.S. Cl. 333—9 2 Claims




1. A power divider having an input port for receiving radio frequency energy within a band of frequencies from a source thereof and N output ports, where N is an integer greater than two, for distributing such energy among N loads, such power divider being fabricated as a printed circuit on one side of a dielectric substrate, the second side of such substrate being covered with an electrically conductive coating, such power divider comprising:

(a) a first printed transmission line connected to the input port, such line having a characteristic impedance matching the characteristic impedance of the source of electromagnetic energy and having a free end;

(b) N printed output transmission lines, each one thereof having one end connected to a different one of the output ports and a free end, the characteristic impedance of each one of the N printed output transmission lines being matched to the characteristic impedance of a corresponding one of the loads;

(c) N printed transmission lines interconnecting the free end of the first printed transmission line and the free end of each different one of the N printed output transmission lines, the characteristic impedance of each one of the printed transmission lines being greater, by a factor of $N^{\frac{1}{2}}$, than the characteristic impedance of each corresponding one of the plurality of loads; and

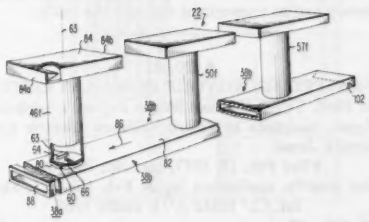
(d) N-1 isolating resistors, each different one connected between the junctions of each successive pair of the N printed transmission lines and N printed output transmission lines.

---

## 4,129,840
## ARRAY OF DIRECTIONAL FILTERS

Chuck K. Mok, Pincourt, Canada, assignor to RCA Corporation, New York, N.Y.

Filed Jun. 28, 1977, Ser. No. 810,875
Int. Cl.[2] H01P 1/20, 7/06, 1/00
U.S. Cl. 333—73 W 4 Claims




1. A filter array for filtering first, second and third contiguous channels of frequencies where frequencies of said third channel are higher than frequencies of said second channel and frequencies of said second channel are higher than frequencies of said first channel, comprising:

a first directional filter having a resonant frequency band that includes said first channel;

a second directional filter having a resonant frequency band that includes said second channel and substantial portions of said first and third channels;

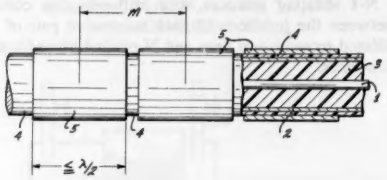
a third directional filter having a resonant frequency band that includes said third channel and a substantial portion of said first channel, all of said filters being of a type that has an end wall with a hybrid slot pair;

a rectangular waveguide having an end adapted for connection to a source and to a load, and a wall with first, second and third ports, said first and second ports being respectively closest to and furthest from said waveguide end, said end walls of said first, second and third filters being connected to said first, second and third ports, respectively, in a manner that causes a signal that passes through said filters to said waveguide to propagate towards said waveguide end.

## 4,129,841
## RADIATING CABLE HAVING SPACED RADIATING SLEEVES

Helmut Hildebrand, Langenhagen, and Gerhard Dunker, Hanover, both of Fed. Rep. of Germany, assignors to Kabel-und Metallwerke Gutehoffnungshutte A.G., Hanover, Fed. Rep. of Germany

Filed Aug. 15, 1977, Ser. No. 824,427
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1976, 2636523
Int. Cl.[2] H01P 3/06
U.S. Cl. 333—84 L 6 Claims



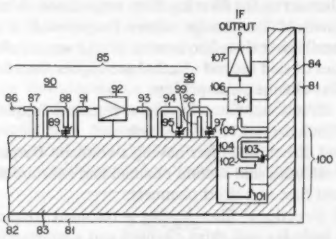

1. Radiating high frequency cable having an inner conductor, an outer conductor and a spacer made of dielectric material disposed and configured so as to establish a concentric relation between the inner and the outer conductors, the outer conductor being constructed to radiate high frequency energy as transmitted through the cable, the improvement comprising:
an insulative envelope on the outer conductor; and
a plurality of radiating elements made of electrically conductive material and placed on the envelope in axially spaced apart relation to each other, each of the elements having an axial length not larger than half the wavelength of the radiated energy at a particular frequency of a radiated band, the elements having an axial center-to-center distance equal to the wavelength of the energy at said frequency and as transmitted through the cable.

---

## 4,129,842
## U-SHAPED MICROSTRIP RESONANT CIRCUIT

Kenichi Torii, Yokohama, and Shigeo Fujimori, Ichikawa, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Feb. 15, 1977, Ser. No. 768,906
Claims priority, application Japan, Feb. 18, 1976, 51-16754
Int. Cl.[2] H03J 3/18; H03B 5/08
U.S. Cl. 334—15 9 Claims



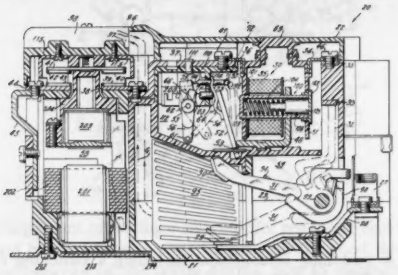

1. A resonant circuit comprising a ground-contacting conductive member; a dielectric layer provided on said ground-contacting conductive member; a ground-contacting member provided on said dielectric layer and electrically connected to said ground-contacting conductive member; at least one U-shaped microstrip line formed on said dielectric layer and having two ends each facing said ground-contacting member; and at least one lumped capacitor connected to said U-shaped microstrip line, one end of said U-shaped microstrip line being grounded through the lumped capacitor of the resonant circuit and the other end thereof being grounded by way of direct grounding.

---

## 4,129,843
## MAGNETIC TRIP MEANS FOR CIRCUIT BREAKER

Frank R. Keller, Villanova; John B. Cataldo, Lansdale, both of Pa.; Frank W. Kussy, Randallstown, Md., and Bernard DiMarco, Bellefontaine, Ohio, assignors to I-T-E Imperial Corporation, Spring House, Pa.

Filed Oct. 5, 1976, Ser. No. 729,699
Int. Cl.[2] H01H 9/00
U.S. Cl. 335—174 9 Claims



1. An electrical switching device including separable switch contact means; a spring powered operating means connected to said switch contact means for opening and closing thereof; an overload device operatively connected to said spring powered operating mechanism; housing means wherein said contact means, said operating means and said overload device are disposed; said housing means including a front opening normally closed by removable cover means; said housing means having means at the rear thereof for operatively securing said switching device in front of a support surface; said overload device upon sensing predetermined overload conditions in circuit with said switching device automatically actuating said spring powered operating mechanism to open said switch contact means; said overload device including a sensing coil in series circuit with the contact means, a stationary magnetic yoke, and a magnetic armature biased away from said yoke and mounted for movement toward said yoke to actuate said spring powered mechanism; said overload device also including additional magnetic means comprising a movable magnetic core coaxial with said coil, projecting out the end of said coil remote from said armature, biasing means urging said core away from said aperture, and additional means for retarding movement of said core into said coil and toward said armature in a controlled manner upon energization of said coil by overload currents; said coil, said yoke and said additional magnetic means being parts of a sub-assembly that is removable and replaceable through said front opening to change the calibration range of the switching device while the armature remains operatively mounted within said housing means as part of the switching device and while said device remains secured to a support surface adjacent the rear of said device.

---

## 4,129,844
## MULTI-DIRECTIONAL POSITIONER

William M. Wells, Midfield, Ala., assignor to Thomas H. Hudson, Birmingham, Ala., a part interest

Filed Jul. 14, 1977, Ser. No. 815,519
Int. Cl.[2] H01F 7/18
U.S. Cl. 335—268 7 Claims

1. In a multi-directional positioner for moving one element relative to another element,
(a) a ball-like member,
(b) a housing having a socket therein receiving said ball-like member with a rotating fit with the inner surface of said socket extending an angular distance around said ball-like

member to retain said ball-like member in said socket with a portion of said ball-like member projecting outwardly of said socket,

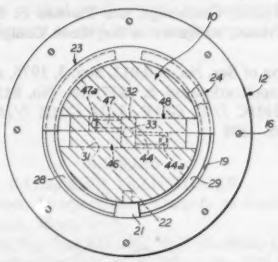
(c) means operatively connecting said portion of the ball-like member projecting outwardly of said socket to said one element,

(d) means operatively connecting said housing to said another element,

(e) at least one arcuate groove in the inner surface of said housing extending in a plane passing generally through the center of said ball-like member,

(f) at least one first arcuate shaped electrical power unit fixedly mounted within said arcuate groove in said housing and being extendable and retractable lengthwise of said arcuate groove in said housing and pivotally connected adjacent one end to an adjacent side of said ball-like member,

(g) means to actuate said first power unit to selectively extend and retract said first power unit within said arcuate groove in said housing to rotate said ball-like member




selectively in opposite directions and impart relative movement between said ball-like member and said housing,

(h) at least one arcuate groove in the outer surface of said ball-like member extending in a plane passing generally through the center of said ball-like member and perpendicular to said arcuate groove in the inner surface of said housing,

(i) at least one second arcuate shaped electrical power unit mounted in said arcuate groove in the outer surface of said ball-like member and being extendable and retractable lengthwise of said arcuate groove in said ball-like member and connected adjacent one end thereof to said ball-like member and pivotally connected adjacent the other end thereof to an adjacent portion of said housing, and

(j) means to actuate said second power unit to selectively extend and retract said second power unit within said arcuate groove in the outer surface of said ball-like member to rotate said ball-like member selectively in opposite directions and impart relative movement between said ball-like member and said housing.

---

**4,129,845**

## VAPORIZATION COOLED ELECTRICAL APPARATUS

**Frank W. Benke, Hermitage, Pa., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.**

**Filed Jul. 15, 1977, Ser. No. 816,129**
**Int. Cl.[2] H01F *27/10***
**U.S. Cl. 336—57** **5 Claims**

1. An electrical inductive apparatus comprising:

a sealed housing;

an electrical winding having top and bottom ends disposed in inductive relation with a magnetic core in said sealed housing;

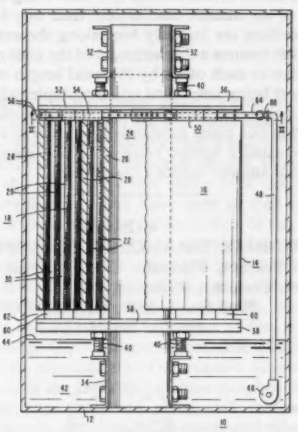
said electrical winding having a plurality of radially spaced cooling ducts extending between said top and bottom ends of said electrical winding;

a dielectric fluid, vaporizable within the normal operating temperature range of said electrical inductive apparatus, disposed within said housing, said dielectric fluid having a liquid level above the bottom of said housing;

means for supplying said dielectric fluid from said bottom portion of said housing to the top portion of said housing;

means for applying compressive stress to said top and bottom ends of the electrical winding, said means including first and second pressure rings, with said first pressure ring disposed around the magnetic core and adjacent said top end of said electrical winding and said second pressure ring disposed around said magnetic core and adjacent said bottom end of said electrical winding, and means for applying pressure to said first and second pressure rings to hold said electrical winding in compression; and

means for distributing said dielectric fluid to the top end of said ducts, said distributing means disposed adjacent said top end of said winding and in fluid flow communication with said supplying means, said distributing means including a first member having a plurality of spacers attached to one surface thereof, said first member disposed with said spacers in registry with said top end of said electrical winding and the other surface of said first member in



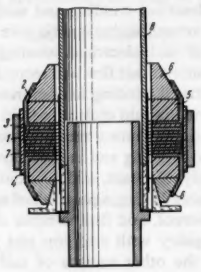
registry with said first pressure ring such that a first passage is formed between said top end of said electrical winding and said first member and compressive force is maintained on said electrical winding, said distributing means including at least one conduit disposed in said first passage and having first and second ends with at least one of said ends disposed in fluid flow communication with said supplying means, said conduit being formed of electrical insulating material and having a plurality of longitudinal and circumferential spaced apertures therein, said conduit further having a predetermined configuration across said top end of said electrical winding in which said apertures are located adjacent said cooling ducts such that said dielectric fluid is uniformly distributed over said cooling ducts; said distributing means further including a second member having a plurality of spacers attached to one surface thereof, said second member disposed with said spacers in registry with said bottom end of said winding and the other surface of said second member in registry with said second pressure ring to form a second passage below said electrical winding.

**4,129,846**

## INDUCTOR FOR MAGNETIC PULSE WORKING OF TUBULAR METAL ARTICLES

**Boris A. Yablochnikov, ulitsa Chaplygina 39, kv. 4, Novosibirsk, U.S.S.R.**

**Filed Aug. 13, 1975, Ser. No. 604,477**
**Int. Cl.[2] H01F *15/04, 27/28***
**U.S. Cl. 336—84 C** **11 Claims**



1. An inductor for magnetic pulse working of tubular articles, comprising: a coil composed of flat conductors insulated from one another, said conductors each being made as a sector portion of an annular disc of less than one full turn, which sector portions are helically bent along the axis of said coil at a pitch that ensures a displacement of the ends of each conductor relative to each other by the axial length of said coil, said conductors being assembled into a multiple helix, and the ends of said conductors on at least one axial end of said coil being arranged in one plane substantially normal to the coil axis and circumferentially spaced relative to one another at substantially equal angular spaces or increments.

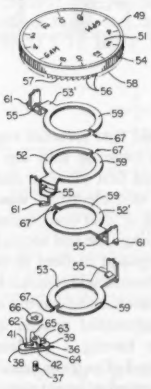
---

**4,129,847**

## CUT-BACK THERMOSTAT CONSTRUCTION

**Allen L. Teichert, Placentia, Calif., assignor to Robertshaw Controls Company, Richmond, Va.**

**Filed Jun. 6, 1977, Ser. No. 803,978**
**Int. Cl.[2] H01H *37/62***
**U.S. Cl. 337—301** **20 Claims**



1. In a cut-back thermostat construction having a thermostat arrangement and a timer means carried by a housing means in such a manner that said timer means will cut-back the temperature setting of said thermostat arrangement by moving an electrical switch means of said thermostat arrangement relative to a temperature responsive switch operator of said thermostat arrangement when a predetermined time is reached by said timer means, said construction also having movable actuator means that is carried by said housing means and is operatively associated with said switch means to be adapted to cause a certain movement of said switch means relative to said switch operator when said actuator means is moved from a first position thereof to a second position thereof by said timer means when said predetermined time is reached by said timer means, said construction also having adjustable means that is carried by said housing means and is separate from said actuator means for selecting the amount of movement of said switch means relative to said switch operator when said actuator means is moved from said first position thereof to said second position thereof whereby said adjustable means selects the cut-back temperature of said thermostat arrangement, the improvement comprising stop means carried inside said housing means for limiting the degree of adjustment of said adjustable means and, thus, the amount of movement of said switch means relative to said switch operator.

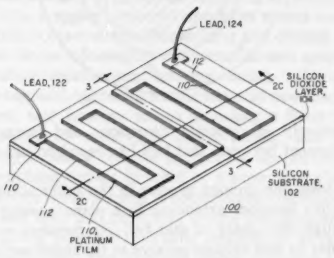
---

**4,129,848**

## PLATINUM FILM RESISTOR DEVICE

**Robert I. Frank, Cambridge, and Thomas E. Salzer, Bedford, both of Mass., assignors to Raytheon Company, Lexington, Mass.**

**Continuation of Ser. No. 610,012, Sep. 3, 1975, abandoned. This application Jul. 5, 1977, Ser. No. 812,866**
**Int. Cl.[2] H01C *7/02*; G01F *23/24*; G01K *7/18*; C23C *15/00***
**U.S. Cl. 338—308** **6 Claims**




1. The product comprising a platinum film resistor produced by the process comprising the steps of:
providing a silicon substrate;
growing a layer of silicon dioxide upon at least one surface of said substrate;
sputter etching said layer of silicon dioxide to produce a plurality of etch pits upon one surface thereof;
sputtering depositing a first quantity of platinum upon said surface of said layer of silicon dioxide at a first sputter power level and first time period;
sputter depositing a second quantity of platinum upon said first quantity of platinum at a second sputter power level and second time period;
sputter depositing a layer of quartz over said platinum;
producing openings in said layer of quartz in a predetermined configuration;
sputter etching portions of said platinum through said openings in said layer of quartz; and
attaching one or more leads to the remaining portions of said platinum.

---

**4,129,849**

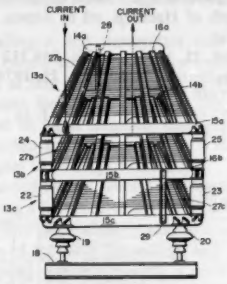
## FAULT CURRENT LIMITING RESISTOR

**Steven Welk, Lansdale, Pa., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.**

**Filed May 3, 1977, Ser. No. 793,306**
**Int. Cl.[2] H61C *7/13***
**U.S. Cl. 338—21** **7 Claims**

1. A fault current limiting resistor comprising a relatively long resistive element of a predetermined resistance for provid-

ing high energy dissipation; means for supporting said element in a frustro-conical configuration, said support means including a large diameter base ring, a spaced small diameter support




ring, a plurality of insulator elements joining said rings and having a frustro-conical configuration, and means for affixing said resistive element to said insulator elements.

---

**4,129,850**

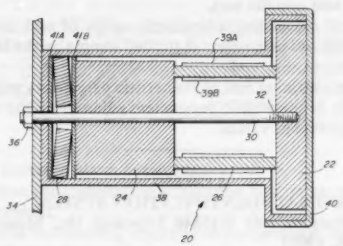
## BALANCED TRANSDUCER

**James E. Mumper, Newport, R.I., assignor to Raytheon Company, Lexington, Mass.**

**Continuation of Ser. No. 415,056, Nov. 12, 1973, abandoned. This application Feb. 3, 1975, Ser. No. 546,361**

**Int. Cl.[2] H04B *13/00***

**U.S. Cl. 340—10** **4 Claims**




1. A transducer assembly comprising:

a transducer element;

a first mass element and a second mass element positioned contiguous to and at opposite ends of said transducer element;

a compliant spring positioned between said second mass element and a first side of a base, said base having an aperture therein; and

a compliant tie rod means urging said first mass element, said transducer element and said second mass element towards one side of said compliant spring, said compliant tie rod means passing freely through said aperture in said base and contacting said base on a side thereof opposite said first side thereof for urging said base toward a side of said compliant spring opposite said one side thereof to counteract a force exerted by said second mass element against said compliance spring, the compliance of said spring being of a value to resonate with said second mass element at a frequency approximately equal to the frequency of a resonance of said first mass element with the compliance of said tie rod means.

**4,129,851**

## ELECTROACOUSTIC TRANSDUCER WITH A MAGNETOSTRICTIVE CORE

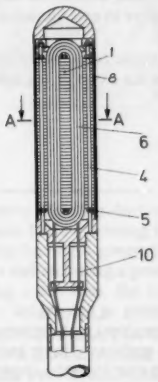
**Jan Podgorski, Bensberg, Germany, assignor to INTERATOM, International Atomreaktorbau GmbH, Bensberg, Koeln, Germany**

**Filed Jan. 18, 1977, Ser. No. 760,221**

**Claims priority, application Fed. Rep. of Germany, Jan. 29, 1976, 7602347[U]**

**Int. Cl.[2] H04B *13/00***

**U.S. Cl. 340—11** **3 Claims**




1. Electromechanical transducer having a magnetostrictive core formed of a superimposed stack of individual plates disposed within a cylindrical protective sheath and having a coil wound thereon in longitudinal direction thereof, the improvement wherein the plates have the shape of a circular disc formed with slots therein which leave open an area central to said disc that corresponds to the cross section of the coil and are disposed alternatingly offset from one another by 180° so that the stack formed by the individual plates is in contact with the inner surface of the protective sheath over the entire circumference thereof, as seen in the axial direction, including a tube secured to and forming an extension of the protective sheath, and leads for the transducer disposed in said tube, said tube being formed alternatingly of corrugated tube members having a given wall thickness and of tube members having a greater wall thickness than said given wall thickness, and including a guide tube within said first-mentioned tube extending coaxially thereto and to said corrugated tube members for maintaining rigidity of said first-mentioned tube.

---

**4,129,852**

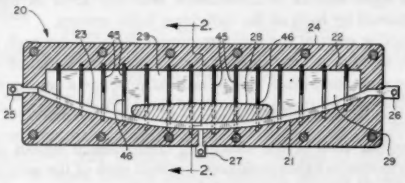
## SLOPE DETECTOR FOR INDICATING FLAT TIRES AND THE LIKE

**John E. Knecht, R.R. #3, St. Anne, Ill. 60964**

**Filed Mar. 25, 1977, Ser. No. 781,291**

**Int. Cl.[2] G01C *9/18***

**U.S. Cl. 340—58** **10 Claims**




1. In a vehicle having an axle and an inflatable tire disposed at each end of the axle, a device for detecting when one of the tires becomes underinflated, comprising:

a slope detector, mounted to the axle, including a curved chamber, an electrically conducting fluid partly filling the chamber, and a resistance element disposed in the chamber in partial contact with the fluid, said resistance element characterized by a resistance between one end of the element and an intermediate node which varies in a predetermined manner with the position of the fluid in the chamber;

means for damping the flow of the fluid to reduce the rate of change of the resistance of the detector caused by movement of the axle and thereby to render the detector substantially insensitive to axle vibration associated with road travel; and

means responsive to the resistance of the detector for detecting variations in the slope of the axle.

---

**4,129,853**

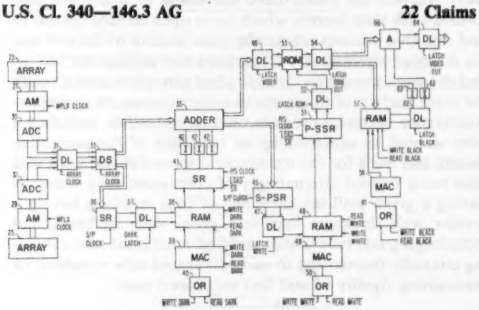
## METHOD AND APPARATUS FOR PRODUCING COMPENSATED SIGNALS FOR INDIVIDUAL LIGHT SENSORS ARRANGED IN A PREDETERMINED RELATION

**William E. Althauser, Longmont, Colo., and Richard A. Barnes, Lompoc, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Sep. 26, 1977, Ser. No. 836,882**

**Int. Cl.[2] G06K 9/00**

**U.S. Cl. 340—146.3 AG** **22 Claims**




1. A method for compensating for noise level variations in individual light sensors arranged in a predetermined relation and for variations in light conditions to which the sensors are subjected including:

producing a separate output signal from each of the individual light sensors in accordance with the level of light received by each of the individual light sensors;

correcting each of the separate output signals from each of the individual light sensors for a noise level variation of the same individual light sensor to produce a sensitivity compensated signal for each of the individual light sensors;

correcting each of the sensitivity compensated signals for variations in light conditions to which each of the individual light sensors is subjected to produce a compensated signal for each of the individual light sensors;

and changing the compensated signal for each of the individual light sensors in accordance with the variation caused by a black area in the presence of illumination.

**4,129,854**

## CELL CLASSIFICATION METHOD

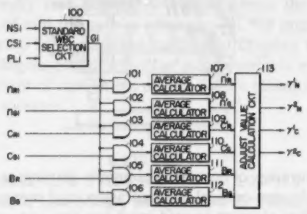
**Ryuichi Suzuki, Kokubunji; Akihide Hashizume, Hachioji; Hideyuki Horiuchi, Kokubunji; Shinji Yamamoto, and Hisatake Yokouchi, both of Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan**

**Filed Oct. 21, 1977, Ser. No. 844,312**

**Claims priority, application Japan, Oct. 25, 1976, 51-127240; Oct. 25, 1976, 51-127245**

**Int. Cl.[2] G06K 9/00; G01N 33/16**

**U.S. Cl. 340—146.3 CA** **10 Claims**




1. A cell classification method having a first step of obtaining as video signals, images of a plurality of sorts cells existent in a cell sample, a second step of calculating a plurality of characteristic parameters of each of the cells from the video signals, and a third step of recognizing the sort of said each cell with the characteristic parameters, characterized in that said second step comprises:

the step of selecting at least one cell of a specific sort (at least one standard cell),

the step of evaluating unstable characteristic parameters of said standard cell,

the step of comparing the values of said unstable characteristic parameters with predetermined standard values of the corresponding characteristic parameters of the standard cell of said specific sort,

the step of calculating adjustment values of said unstable characteristic parameters in the cell sample on the basis of the comparisons, and

the step of obtaining first characteristic parameters with said unstable characteristic parameters adjusted by the use of said adjustment values.

---

**4,129,855**

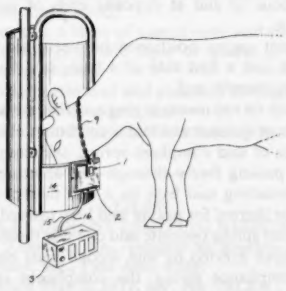
## ANIMAL IDENTIFICATION SYSTEM

**James A. Rodrian, N61 W15846 Edgemont Dr., Menomonee Falls, Wis. 53051**

**Filed Jul. 15, 1977, Ser. No. 815,796**

**Int. Cl.[2] H04Q 9/00; G08G 1/00; G01S 9/56**

**U.S. Cl. 340—152 T** **12 Claims**



11. An identification system which comprises:

an oscillator for generating a pulse train at an output terminal;

first counter means connected to the oscillator output terminal for counting the number of pulses generated thereat, said first counter having an output at which the total count is indicated when a signal is received at an enable terminal;

means including a first transmitter coil connected to the oscillator output terminal for establishing an electromagnetic field at said oscillator frequency;

second counter means for counting the number of pulses received at its input terminal, said second counter being operable when a preselected count is reached to generate a reset signal at its output terminal;

means connected to said second counter means input terminal including a first receive coil for converting the electromagnetic field established by said first transmitter coil to a pulse train of the same frequency; and

second coupling means including a reset pulse transmitter coil and a reset pulse receive coil for coupling the second counter means reset signal to the enable terminal on the first counter means.

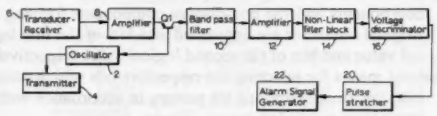
---

**4,129,856**

## FILTER SYSTEM AND METHOD FOR INTRUSION ALARM

**Peter E. Humphries, King, Canada, assignor to Contronic Controls Limited, Mississauga, Canada**

**Filed Nov. 15, 1976, Ser. No. 742,048**
**Int. Cl.[2] G01S *9/02*; G08B *13/16***
**U.S. Cl. 340—554** **9 Claims**




1. An intrusion alarm comprising:

(1) means for transmitting a radiation field in an area to be supervised,

(2) means for receving a portion of the radiation field which is reflected from objects in the supervised area,

(3) means for comparing the transmitted and received fields and for producing a comparison signal having pulsations the frequency of which is indicative of the speed of movement of an object in said supervised area,

(4) means connected to said comparison means for generating an output pulse train of constant peak amplitude, said output pulse train having an average level, said means for generating including means for controlling the duty cycle of said output pulse train for said average level of said output pulse train to increase as the frequency of said comparison signal increases, until the frequency of said comparison signal reaches a selected frequency, and then to decrease as the frequency of said comparison signal increases beyond said selected frequency,

(5) integrating means, connected to said means for generating (4), for integrating said output pulse train to produce an integrated d.c. signal therefrom, said d.c. signal having an average level,

(6) and means connected to said integrating means and responsive to said average level of said integrated d.c. signal for producing an alarm signal when such average level rises above a preselected level.

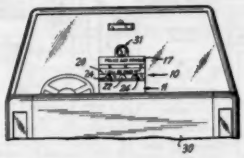
---

**4,129,857**

## PORTABLE DRIVER EMERGENCY DEVICE

**Albert Espinosa, 838 Riverside Dr., New York, N.Y. 10032**

**Filed May 26, 1977, Ser. No. 800,974**
**Int. Cl.[2] B60Q *7/00***
**U.S. Cl. 340—321** **8 Claims**




8. A portable emergency signaling device comprising:

a relatively lightweight, hollow housing having an opening therein, said housing having a generally L-shaped, elongated configuration and including a generally rectangular, hollow base, having a top face, the forward portion of which serves as a ledge, and a generally rectangular, hollow member connected to, and extending upwardly from the rear portion of the top face of said base, said member having a top face which serves as a ledge and a front face disposed adjacent to said forward portion of said top face of said base, in which said opening is defined;

a translucent message board slidably mounted on said housing across said front face of said opening thereof and having an emergency message imprinted thereon;

clock dial means mounted on the top face of said member of said housing for use in association with said message board and for establishing a time reference relative to the message on said message board;

a first light source mounted within said member of said housing and disposed behind said message board for effecting illumination thereof;

at least two dome-covered second light sources mounted in spaced-apart relationship on said forward portion of said top face of said base for signaling a distress signal, and connected in parallel with said first light source:

a flasher mounted within said base of said housing and serially connected to said second light sources;

an electrical power source comprising a battery mounted within said base of housing and serially connected to said flasher and light sources; and

switch means mounted on the top face of said member of said housing and serially connected to said power source, light sources and flasher for activating and deactivating the device.

---

**4,129,858**

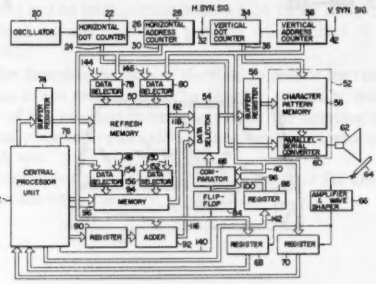
## PARTITIONED DISPLAY CONTROL SYSTEM

**Toshitaka Hara, Hitachi, Japan, assignor to Hitachi, Ltd., Japan**

**Filed Mar. 23, 1977, Ser. No. 780,497**
**Claims priority, application Japan, Mar. 25, 1976, 51-32997**
**Int. Cl.[2] G06F *3/14***
**U.S. Cl. 340—324 AD** **8 Claims**

1. A system for controlling display of characters on a display surface comprising display means for sequentially displaying characters on said display surface in response to continuous receipt of input data, a refresh memory having a capacity sufficient to store application display data for producing an application display of characters on the entire area of said display surface in an application display mode of operation, a special display data source supplying special display data for producing a special display of characters on a limited region of

said display surface in a special display mode of operation, and data selection control means connected to said refresh memory and said special display data source for effecting alternative selection of the application display data read out from said




refresh memory to produce an application display on the entire area of said display surface or the sequential selection of said application display data and said special display data to produce a special display on said limited region and an application display only on the remaining region of said display surface.

---

**4,129,859**

## RASTER SCAN TYPE CRT DISPLAY SYSTEM HAVING AN IMAGE ROLLING FUNCTION

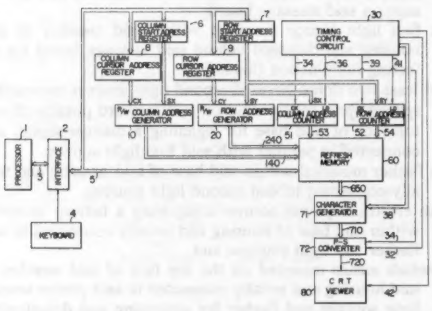
**Masahiro Iwamura; Nagaharu Hamada; Toshitaka Hara, all of Hitachi, and Nobuo Sato, Iwaki, all of Japan, assignors to Hitachi, Ltd., Japan**

**Filed Feb. 8, 1977, Ser. No. 766,728**

**Claims priority, application Japan, Feb. 12, 1976, 51-13183**

**Int. Cl.[2] G06F *3/14***

**U.S. Cl. 340—324 AD** **5 Claims**




1. A raster scan type CRT display system having an image rolling function wherein coded data stored in a refresh memory is read out in synchronism with the scan of a CRT display and is displayed on a CRT viewer in accordance with a sequence of display column and row addresses, said CRT viewer having a display capacity of m columns by n rows and said refresh memory can be accessed by a processor for read/write operation, said display system comprising:

said refresh memory being randomly accessable and having a storage capacity of at least m x n characters;

a timing control circuit for generating timing signals which include character clock pulses and line clock pulses;

column and row start address registers for defining a read start address for said refresh memory;

column and row cursor address registers for defining an address for the read/write operation by said processor to said refresh memory;

a modulo m address counter to which the content of said column start address register is preset for each horizontal scan and which counts up the character clock pulses from said timing control circuit starting from the preset count to produce a sequence of display column addresses; and

a modulo n address counter to which the content of said row start address register is preset for each vertical scan and which counts up the line clock pulses from said timing control circuit starting from the preset count to produce a sequence of display row addresses.

---

**4,129,860**

## APPARATUS FOR FORMING A CHARACTER BY A MATRIX PATTERN OF PICTURE ELEMENTS

**Setsuo Yonezawa; Tsuneta Kawakami; Tatsuo Shimada, and Yoshinori Chida, all of Tokyo, Japan, assignors to Kabushiki Kaisha Seikosha, Japan**

**Filed Sep. 13, 1976, Ser. No. 723,291**

**Claims priority, application Japan, Sep. 12, 1975, 50-110596**

**The portion of the term of this patent subsequent to Mar. 14, 1995, has been disclaimed.**

**Int. Cl.[2] G06F *3/14***

**U.S. Cl. 340—324 AD** **8 Claims**

1. An apparatus for expanding an original character formed by a matrix of display components and non-display components comprising;

first means for storing a bit pattern in which the display components and the non-display components forming an original character are converted into bits of the first logical value and bits of the second logical value respectively;

second means for selecting the respective bits which constitute the aforementioned bit pattern in accordance with a predetermined order;

first storage means for storing the number of row magnification of the original character;

second storage means for storing the number of column magnification of the original character independently of said first storage means whereby said number of column magnification may be arbitrarily different from said number of row magnification;

third means for converting the respective bits selected by said second means into a bit matrix in which the number of bits arranged in the respective rows coincides with said number of row magnification stored in said first storage means and the number of bits arranged in the respective columns coincides with that said number of column magnification independently stored in said second storage means, and

fourth means for forming dots in accordance with the output of said third means and thereby forming a magnified character.

---

**4,129,861**

## MULTIPLEX ADDRESSING OF ELECTROCHROMIC DISPLAYS

**Robert D. Giglia, Rye, N.Y., assignor to American Cyanamid Company, Stamford, Conn.**

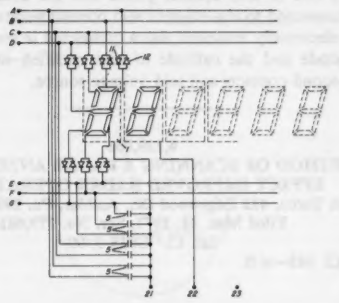
**Filed Jan. 27, 1976, Ser. No. 652,935**

**Int. Cl.[2] G02F *1/13***

**U.S. Cl. 340—324 R** **6 Claims**

1. A display system comprising a plurality of persistent

electrochromic display elements and means to multiplex said display elements, said means comprising diode means to provide a sufficient threshold voltage only to each display element



to be displayed or erased and voltage threshold conduction means connected to each display element so that only a directly addressed element will be activated.

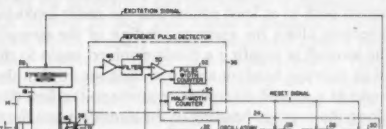
---

**4,129,862**

## APPARATUS FOR DIGITALLY ENCODING THE ANGULAR POSITION OF A SHAFT WITH RESPECT TO A REFERENCE BEARING

**Irving I. Kaplan, 712 Kahn Dr., Baltimore, Md. 21208, and Daniel J. Lincoln, 12002 Terra La., Bowie, Md. 20715**

**Filed Mar. 10, 1976, Ser. No. 665,649**
**Int. Cl.[2] H03K *13/02*; G01D *5/34***
**U.S. Cl. 340—347 P** **20 Claims**



1. Apparatus for digitally encoding the angular position of a first shaft with respect to a reference position, said apparatus comprising:

a second shaft having an indicating element, said second shaft being concentrically disposed with respect to said first shaft;

signal generating means for generating an output signal of a predetermined frequency;

counting means for providing an excitation signal and an incremental angle signal in response to the output signal of said signal generating means;

motive means for rotating said second shaft at a predetermined average rate in response to the excitation signal of said counting means;

reference position detector means responsive to the indicating element of said second shaft to provide a reset signal as a function of the angular position of the second shaft with respect to said reference position, said reset signal being provided to said counting means to initialize the incremental angle signal;

shaft position detector means responsive to the indicating element of said second shaft to provide a clock signal as a function of the angular position of said second shaft with respect to said first shaft; and

storage means responsive to the angle incremental signal and to the clock signal, said storage means storing the incremental angle signal in response to the clock signal to provide an angular position signal.

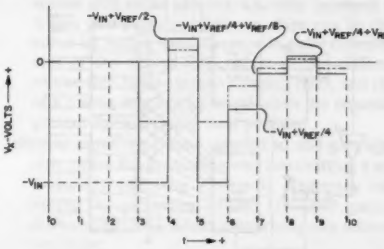
---

**4,129,863**

## WEIGHTED CAPACITOR ANALOG/DIGITAL CONVERTING APPARATUS AND METHOD

**Paul R. Gray, Orinda, Calif.; James L. McCreary, Red Bank, N.J., and David A. Hodges, Berkeley, Calif., assignors to Regents of the University of California, Berkeley, Calif.**

**Filed Oct. 3, 1977, Ser. No. 838,908**
**Int. Cl.[2] H03K *13/02***
**U.S. Cl. 340—347 AD** **16 Claims**




1. An analog/digital converter for converting between an analog and a digital signal, comprising an array of binary weighted capacitors having capacitance values corresponding to a predetermined number of binary bits ranging from a most to a least significant bit, a common plate node within said array, a voltage comparator having first and second input terminals and an output terminal, said common plate node being connected to said first input terminal, said second input terminal being connected to a first predetermined reference, a digital control circuit coupled to said output terminal, a first switch operated by said digital control circuit to selectively connect said common plate node to said first predetermined reference, a second switch operated by said digital control to alternately select the analog signal and a second predetermined reference, and a plurality of additional switches operated by said digital control circuit, each of said plurality of additional switches being configured to selectively connect ones of said array of binary weighted capacitors to said first predetermined reference and said second switch, said digital control circuit being responsive to a serial digit input sequence so that said array of binary weighted capacitors sequentially samples and holds the analog signal, divides said second predetermined reference signal into binary weighted portions, combines the binary weighted portions with the analog signal to provide combined signal levels, and said comparator comprises each of said combined signal levels with said first predetermined reference, whereby said voltage comparator quantizes said analog signal as a serial digit output at said output terminal.

---

**4,129,864**

## HIGH SPEED, WIDE DYNAMIC RANGE ANALOG-TO-DIGITAL CONVERSION

**Robert J. Carpenter, and Kenneth W. Yee, both of Rockville, Md., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.**

**Division of Ser. No. 663,401, Mar. 3, 1976, Pat. No. 4,069,479.**
**This application Nov. 3, 1977, Ser. No. 848,041**
**Int. Cl.[2] H03K *13/02***
**U.S. Cl. 340—347 AD** **1 Claim**

1. An analog-to-digital conversion system for outputting an N bit word, comprising,

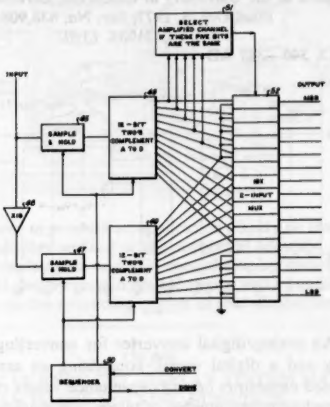
an input for receiving an analog input signal,

a pair of two's complement analog-to-digital converters, one being a higher range converter and the other being a lower range converter, each converter having a resolution of K bits where K is a number which is smaller than N,

a unit gain path between said input and said higher range converter,

amplification means between said input and said lower range converter, said amplification means having a gain equal to the desired ratio of the full-scale ranges of said two converters,

means for selecting said higher range converter when there are more than N-2(N-K) significant bits in its output and for otherwise selecting said lower range converter, and,



means for providing an N bit output word which is comprised of the output bits of said selected converter and N-K higher output bits having the same level as the most significant bit of said lower range converter when said lower range converter is said selected converter, and which is comprised of the output bits of said selected converter and N-K lower output bits having a zero level when said higher range converter is said selected converter.

---

**4,129,865**

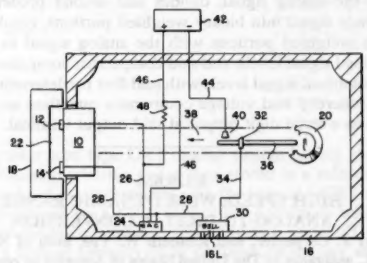
**ALARM CIRCUIT FOR A DOOR LOCK**

**Lawrence Randall, 2339 N. Commonwealth, Chicago, Ill. 60614**

**Filed Sep. 19, 1977, Ser. No. 834,830**

**Int. Cl.[2] E05B *45/12***

**U.S. Cl. 340—542** **3 Claims**



1. In a lock of the type having a latch tongue which is received within a latch tongue housing by rotating a key in a tumbler assembly, the improvement comprising: a voltage source;

a first contact connected to said tumbler assembly for movement in response to a rotation of said key;

a second contact which is stationary, said contacts being in an abutting relationship when said latch tongue is received within said housing;

a pair of contact points insulated from each other and mounted upon said latch tongue, said contact points being electrically connected together when said latch tongue is received within said housing;

a silicon controlled rectifier with the gate thereof connected to one of said contact points and the cathode thereof connected to the other of said contact points; and

an electrically activated alarm connected in series with the anode and the cathode of said rectifier, said first and second contacts and said voltage source.

---

**4,129,866**

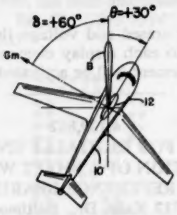
**METHOD OF SCANNING A RADAR ANTENNA TO EFFECT IMPROVED RADAR OPERATION**

**Joseph Turco, 412 Edgewood Dr., Ambler, Pa. 19002**

**Filed Mar. 21, 1977, Ser. No. 779,681**

**Int. Cl.[2] G01S *9/00***

**U.S. Cl. 343—5 R** **2 Claims**




1. A method of enhancing the scan capability of a radar afixed to an aircraft comprising:

compelling the aircraft to follow a predetermined sinusoidal path; and

synchronizing the scan angle of the radar to the predetermined path to at least assure that the radar looks in a first direction along the average heading of the aircraft when the aircraft is pointing a predetermined angle to the right of its average heading and to at least assure that the radar looks in a second direction, opposite to the first direction, along the average heading of the aircraft when the aircraft is pointing a predetermined angle to the left of its average heading.

---

**4,129,867**

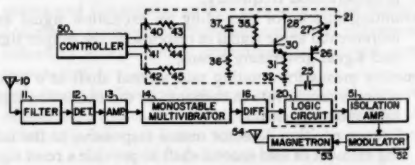
**MULTI-PULSE MODULATOR FOR RADAR TRANSPONDER**

**Gary L. Schrack, Tempe, Ariz., assignor to Motorola Inc., Schaumburg, Ill.**

**Filed Apr. 28, 1977, Ser. No. 791,666**

**Int. Cl.[2] H03K *5/13*; G01S *9/56***

**U.S. Cl. 343—6.8 R** **11 Claims**




7. A pulse coding system adapted to respond to regularly recurring pulses and to provide output pulses which simulate closely spaced pulses to provide information, such as an identifying code, said coding system comprising variable delay means connected to be activated by the recurring pulses and providing an output pulse in response to each recurring pulse, said variable delay means being preprogrammed to provide predetermined delays between each recurring pulse and the subsequently provided output pulse.

4,129,868

## RADAR BEACON APPARATUS

Kiyokazu Tahara, and Keigo Kotoh, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 27, 1977, Ser. No. 763,115
Int. Cl.[2] G01S 9/56
U.S. Cl. 343—6.8 R 5 Claims

1. In a radar beacon apparatus used to communicate position location to a search radar during an emergency rescue operation, said search radar transmitting radar pulse waves of a particular pulse repitition period, detecting received beacon signals having frequencies within a specific bandwidth, and displaying said received beacon signals on a search radar PPI, the improvement comprising:

receiver means for detecting said radar pulse waves of said search radar,

gate signal generating means coupled to said receiver means for producing a gate signal in response to the detection by said receiver means of said radar pulse waves, said gate signal having a time interval less than said search radar pulse repetition period,

transmitter means coupled to said gate signal generating means for generating and repetitively transmitting during said interval of said gate signal a frequency modulated signal which linearly sweeps frequency over a predetermined frequency band, said predetermined frequency band encompassing and overlapping said bandwidth of said search radar, said transmitter means furthermore maintaining a constant phase and frequency relationship between said frequency modulated signals generated during successive gate signals,

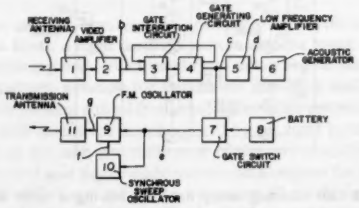
whereby said radar beacon repetitively transmits during said gate period a plurality of beacon signals through said bandwidth of said search radar, said search radar detecting said plurality of beacon signals and integrating effects thereof to produce on said search radar PPI a bright pattern indicative of the position of said radar beacon.

4,129,869

## AUTOMATICAL SIGNALLING APPARATUS

Akiyoshi Morinaka, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 27, 1977, Ser. No. 763,235
Int. Cl.[2] G01S 9/56
U.S. Cl. 343—6.8 R 4 Claims




1. In an automatic rescue signalling apparatus for generating and transmitting a return signal upon the reception of a radar pulse wave from a rescue ship, the improvement comprising:

gate signal generation means for converting said received radar pulse wave into an ON-OFF gate signal at the repeat frequency of the radar pulse wave;

gating means coupled to said gate signal generation means for interrupting the input to said gate signal generation means during the generation of said ON-OFF gate signal;

acoustic generator means coupled to said gate signal generation means for converting said amplified ON-OFF signal into repeating audible sound having a frequency equal to the repeat frequency of the received radar pulse wave and a time period which is increased by the side lobe of the rescue ship radar antenna whereby received radar pulse waves of a plurality of rescue ships can be discriminated either by noting the difference in pulse repetition frequencies of the rescue ship radars or the difference in the rescue ship radar antenna rotating rates, and the approach of a rescue ship can be noted when the repeating sound is present for increasing time periods;

distress signalling means coupled to said gate signal generation means for generating and transmitting a synchronous frequency sweeping FM radio frequency return signal during the generation of said ON-OFF gate signal, said distress signalling means comprising a synchronous sweep oscillator;

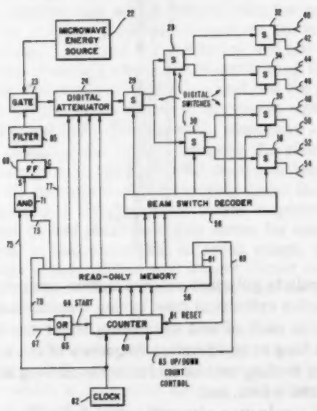
whereby said audible sound produced by said acoustic generator means alerts of the approach of a marine search party.

4,129,870

## APPARATUS FOR SYNTHESIS OF SCANNING BEAM

Donald J. Toman, Pleasantville, N.Y., assignor to Tull Aviation Corporation, Kansas City, Mo.

Filed Sep. 30, 1977, Ser. No. 838,094
The portion of the term of this patent subsequent to Sep. 20, 1994, has been disclaimed.
Int. Cl.[2] G01S 1/16, 1/54
U.S. Cl. 343—106 R 8 Claims




1. Apparatus for synthesizing a continuous scanning beam of radio energy comprising

an array of fixed antenna elements providing radiation beam ports aimed radially outwardly to different angles in an arc over which the scanning beam is to be scanned,

a source of microwave radio frequency energy,

switching means connected between said energy source and said antenna elements and operable for rapidly switching the radio frequency energy in a repeating sequence of bursts of energy to illuminate the different ones of the radiation beam ports at a switching frequency which is substantially greater than the rate of successive intercep-

tion of the scanning beam to be synthesized with the individual radiation beam port positions,

means connected for modulating the energy levels of the individual bursts of radio frequency energy in a predetermined program to provide a composite beam energy profile which is a synthesized directional beam which is moving at a predetermined desired scanning rate,

said modulating means being operable to provide energy levels of the successive individual bursts of radio frequency energy from each radiation beam port producing a composite energy profile from that port which is representative of the impulse function of a low pass filter.

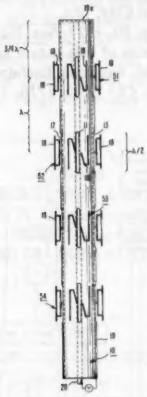
---

**4,129,871**

## CIRCULARLY POLARIZED ANTENNA USING SLOTTED CYLINDER AND CONDUCTIVE RODS

McKinley R. Johns, Cherry Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 12, 1977, Ser. No. 832,460
Int. Cl.[2] H01O *13/12*
U.S. Cl. 343—727 8 Claims



1. A circularly polarized antenna system comprising:

a conductive cylindrical mast having longitudinally extending slots, each of said slots being about one-half wavelength long at an operating frequency of the antenna,

means for feeding each of said slots for exciting horizontally polarized waves, and

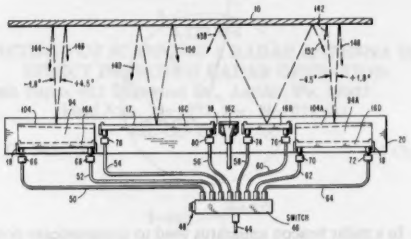
a pair of conductive elements associated with each of said slots for exciting vertically polarized waves, each of said conductive elements being approximately one wavelength resonant elements at said operating frequency, one of the conductive elements of each pair being fixed at one end to a feed point near the midpoint of one elongated side of said slot and having a free end portion extending parallel to the slots and in one longitudinal direction and the other of said conductive elements of each pair being fixed at one end to a feed point near the midpoint of the opposite elongated side of said slot and having a corresponding free end portion extending parallel to the slots and in longitudinal direction opposite said first direction.

**4,129,872**

## MICROWAVE RADIATING ELEMENT AND ANTENNA ARRAY INCLUDING LINEAR PHASE SHIFT PROGRESSION ANGULAR TILT

Donald J. Toman, Pleasantville, N.Y., assignor to Tull Aviation Corporation, Kansas City, Mo.

Filed Nov. 4, 1976, Ser. No. 738,659
Int. Cl.[2] H01Q *13/10, 19/14*
U.S. Cl. 343—768 23 Claims



1. A line source microwave radiation element for feeding a reflector for radiating two shaped beams at selected angles comprising

a slotted waveguide arranged to receive signal inputs at either end and having loading slots arranged in the face of one wall thereof and spaced transversely with respect to the longitudinal axial center line thereof to produce beams of a desired shape within a central plane containing said axial center line,

said loading slots having predetermined center-to-center spacings in the longitudinal dimension to provide a predetermined squint angle within said central plane for each radiated beam with respect to the plane of said slotted face and related to the direction in which energy is fed to the waveguide,

and means for providing a linear phase shift progression in the signal components radiated from the slots from one end of said waveguide to the other to thereby provide a predetermined angular tilt to each radiated beam within said central plane which is independent of the direction in which energy is fed to the waveguide and which is algebraically added to said squint angle.

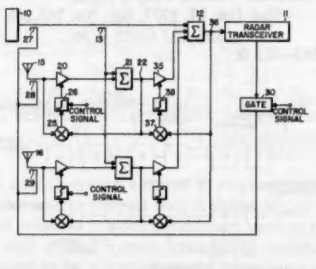
---

**4,129,873**

## MAIN LOBE SIGNAL CANCELLER IN A NULL STEERING ARRAY ANTENNA

Peter D. Kennedy, Mesa, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Nov. 15, 1976, Ser. No. 741,922
Int. Cl.[2] H01Q *3/26*
U.S. Cl. 343—854 9 Claims




1. In a null steering array antenna having a main antenna characterized by a radiation pattern with a relatively narrow main lobe and a plurality of secondary antennas forming a sub-array for providing a null in the direction of an undesired

signal without substantially affecting the main lobe, a main lobe signal canceller comprising:

(a) A plurality of first feedback means one each coupled to each secondary antenna for removing the main lobe signal from the output signal thereof, each first feedback means including first adjustable weighting means for varying the phase and amplitude of signals from the associated secondary antenna and providing an output signal indicative of the varied signal, first summing means coupled to receive the output signal from said first weighting means and at least a portion of the output signal from the main antenna and provide an output signal indicative of the sum thereof, and first correlating means connected to correlate the output signal of said first summing means with the signal from the associated secondary antenna and provide an output signal coupled to said first weighting means for adjusting the phase and amplitude of the output signal thereof to remove main lobe signals therefrom; and

(b) second feedback means including a plurality of second adjustable weighting means one each connected to receive the output signal from each of said first summing means for varying the phase and amplitude thereof and providing an output signal indicative of the varied signal, second summing means connected to receive the output signals from said second weighting means and the signal from the main antenna and provide an output signal indicative of the sum thereof, and a plurality of second correlating means each connected to correlate the output signal of said second summing means with the output signal of the associated first summing means and providing an output signal coupled to said associated second weighting means for adjusting the phase and amplitude of the output signal thereof to provide a null in the direction of an undesired signal.

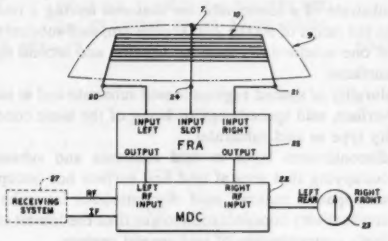
---

**4,129,874**

## ANTENNA PATTERN COMBINER

**Arthur Luedtke, Marietta, and William F. Bentley, Smyrna, both of Ga., assignors to The United States of America as represented by the Field Operations Bureau of the Federal Communications Commission, Washington, D.C.**

**Filed Sep. 19, 1977, Ser. No. 834,203**
**Int. Cl.[2] H01Q *3/26*; G01S *5/04***
**U.S. Cl. 343—854** **5 Claims**



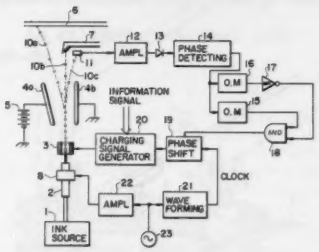

1. An antenna combiner comprising a left cardioid pattern antenna input, a right cardioid pattern antenna input, a means for combining said left and said right inputs into an omnidirectional pattern, a means for impedance matching said omnidirectional pattern, a third front-rear figure eight pattern antenna input, with means for matching said figure eight input, means for taking the sum and difference of the said omnidirectional patterns and said figure eight pattern with outputs for said sum and said difference, means for bypassing all combining means and passing the said left cardioid antenna input and said right cardioid antenna input to said sum output and said difference output respectively.

**4,129,875**

## PHASE CONTROL FOR INK JET PRINTER

**Syoichi Ito, Ibaraki, and Takahiro Yamada, Hitachi, both of Japan, assignors to Hitachi, Ltd., Japan**

**Filed Sep. 10, 1976, Ser. No. 722,032**
**Claims priority, application Japan, Sep. 19, 1975, 50-112612**
**Int. Cl.[2] G01D *18/00***
**U.S. Cl. 346—75** **4 Claims**




1. In an ink jet printer including means for producing a stream of ink under pressure from a nozzle along a predetermined path at a point of which said stream separates into ink droplets to be directed towards a recording medium; an electromechanical transducer coupled to said nozzle for imparting vibrations to said ink under pressure in order to control the separation of said ink droplets to occur at regular intervals; a high frequency power supply for applying a vibration voltage to said electromechanical transducer; a charging electrode disposed along said predetermined path at the point of drop separation for applying voltages to said ink droplets; deflection means for generating a deflecting electric field along the path of said ink droplets downstream of said charging electrode; charging signal generator means for applying charging signals to said charging electrodes for recording and for phase detection in response to applied clock signals synchronized to the output of said high frequency power supply; a sensor disposed at a point adjacent said predetermined path for intercepting deflected ink droplets properly charged on the basis of the phase detecting signal and for producing a signal indicative thereof; phase detecting means for discriminating the relation between the phases of said charging signal and the generation of said ink droplet on the basis of an output signal of said sensor; and phase shift adjusting means responsive to a trigger signal for changing the relation between the phases of said vibration voltage to be applied to said electromechanical transducer and the generation of said charging signal; the improvement comprising a trigger circuit means responsive to the output signal of said phase detecting means for applying said trigger signal to said phase shift adjusting means, and inhibit circuit means which inhibits said trigger circuit means from operating for a prescribed period of time after the generation of a trigger signal,

wherein said inhibit circuit means comprises an AND gate which is connected between said trigger circuit means and said phase shift adjusting means, and a one-shot multivibrator which is connected between said phase detecting means and said AND gate.

---

**4,129,876**

## APPARATUS FOR MOUNTING A MARKER PEN TO A TUBULAR RECORDER PEN ARM

**James R. Hubbard, Moorestown, N.J., assignor to Graphic Controls Corporation, Cherry Hill, N.J.**

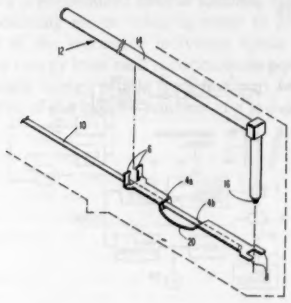
**Filed Jun. 2, 1977, Ser. No. 802,738**
**Int. Cl.[2] G01D *15/16***
**U.S. Cl. 346—140 A** **8 Claims**

1. A clip for mounting a marker pen to a tubular recorder arm comprising:

(a) an elongated resilient clip member having at least two

apertures formed therein, said apertures axially alignable with each other so that a tubular recorder arm may be inserted therethrough against the resilient urging of the clip; and

(b) fastening and positioning means located on said clip for securing a marker pen to said clip member,



said fastening and positioning means comprise at least two sets of pronged projections, displaced lengthwise along said clip, one set of projections extending at an angle from the portion of said clip adjacent thereto, the other set coplanar with the clip portion adjacent thereto.

---

**4,129,877**

## PHOTOGRAPHIC CAMERA HAVING ELECTROMAGNETIC OPERATION CONTROL

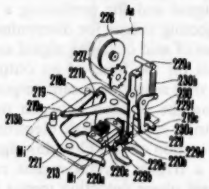
**Masayoshi Yamamichi, Kawasaki; Yukio Iura, Yokosuka; Nobuo Tezuka, Tokyo; Satoshi Watanabe, Inagi; Masanori Uchidoi, Kawasaki, and Hiroshi Aizawa, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Aug. 2, 1976, Ser. No. 710,889**

**Claims priority, application Japan, Aug. 5, 1975, 50-95120**

**Int. Cl.[2] G03B *9/06***

**U.S. Cl. 354—271** **6 Claims**



1. An electromagnetic control system comprising:

(a) an electromagnet;

(b) movable means arranged to be movable between a position where it is in contact with said electromagnet and a position where it is spaced apart from said electromagnet;

(c) first resilient means connected to said movable means to urge said movable means for movement to said contacting position;

(d) driving means for driving said movable means wherein said driving means is shifted between a first position at which said movable means remains at a contacting position and a second position at which said movable means is driven by said driving means to a spaced position;

(e) second resilient means connected to said driving means to urge said driving means for movement to the second position;

(f) resetting means for moving said driving means to the first position against the force of said second resilient means;

(g) latching means for latching said driving means in the first position;

(h) release means for releasing said latching means from its latching position; and

(i) transmitting means arranged between said movable means and said driving means, wherein said transmitting means releases the associated state between the driving means and the movable means as the driving means is shifted from the second position to the first and retains said associated state as the driving means is shifted from the first position to the second position, said transmitting means being provided with position-adjusting means arranged to adjust the spacing relation between said driving means latched in the first position and said movable means;

whereby when said driving means is moved to the first position, said movable means is caused to move to the contacting position by said first resilient means, while when said driving means is moved to the second position, said movable means is caused to move to the spaced apart position under the action of said second resilient means which overcomes said first resilient means.

---

**4,129,878**

## MULTI-ELEMENT AVALANCHE PHOTODIODE HAVING REDUCED ELECTRICAL NOISE

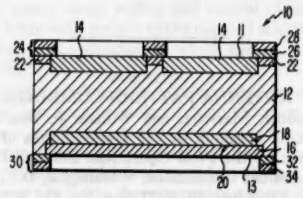
**Paul P. Webb, Quebec, Canada, assignor to RCA Limited, Ste. Anne de Bellevue, Canada**

**Filed Oct. 17, 1977, Ser. No. 843,041**

**Claims priority, application Canada, Sep. 21, 1977, 287176**

**Int. Cl.[2] H01L *29/90, 27/14***

**U.S. Cl. 357—13** **8 Claims**



1. A multi-element avalanche photodiode comprising:

a substrate of a semiconductor material having a resistivity in the range of 500 to 20,000 ohm-cm, said substrate being of one conductivity type having first and second opposed surfaces;

a plurality of spaced regions in said substrate and at said first surface, said spaced regions being of the same conductivity type as said substrate;

a discontinuous layer in said substrate and substantially occupying that area at said first surface not occupied by said spaced regions, said discontinuous layer having a conductivity concentration lower than the lowest conductivity concentration of said spaced regions,

a first layer in said substrate and at said second surface, said first layer of a conductivity type opposite that of said substrate;

a second layer in said substrate spaced from said second surface and contiguous to said first layer, said second layer of the opposite conductivity type as said first layer thereby forming an avalanche junction therebetween;

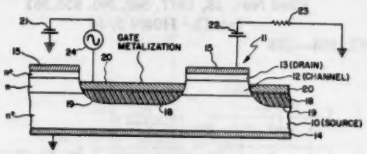
a first passivation region on said first surface covering said discontinuous layer and slightly overlapping said spaced regions; and

a second passivation region extending along the periphery of said second surface and slightly overlapping said first layer.

## 4,129,879
## VERTICAL FIELD EFFECT TRANSISTOR

Wirojana Tantraporn, and Se P. Yu, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 789,516, Apr. 21, 1977, abandoned. This application May 22, 1978, Ser. No. 908,508
Int. Cl.[2] H01L *29/80*
U.S. Cl. 357—22 6 Claims




1. A field effect transistor comprising

a first outer heavily doped semiconductor layer upstanding from which is a mesa structure comprising an inner moderately doped semiconductor layer and a second outer heavily doped semiconductor layer, all of said semiconductor layers being of the same conductivity type and one of said outer layers being the source region while the other is the drain region and said inner layer is the channel region,

contact metallizations on the external opposing surfaces of the outer semiconductor layers,

an insulating layer attached to the inner surface of said first outer layer surrounding said mesa structure, and

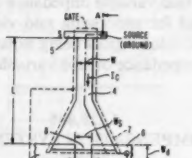
gate metallization on said insulating layer and surrounding said mesa structure so as to be adjacent to the side edges of said inner semiconductor layer and define an electronically blocking contact to the channel region, said channel region consisting of the entire inner semiconductor layer and extending from edge to edge of the mesa structure without interruption.

---

## 4,129,880
## CHANNEL DEPLETION BOUNDARY MODULATION MAGNETIC FIELD SENSOR

Albert W. Vinal, Cary, N.C., assignor to International Business Machines Incorporated, Armonk, N.Y.

Filed Jul. 1, 1977, Ser. No. 812,298
Int. Cl.[2] H01L *27/22, 29/82, 29/96*
U.S. Cl. 357—27 10 Claims



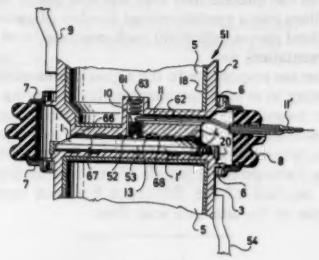

1. In a semiconductive, channel conduction, field sensor device having a substrate of semiconductive material, a source region and at least two separated drain regions in said substrate and a conductive channel in said substrate connecting said source and said drains, the improvement comprising:

said channel of conducting material having a filamentary form defined by having a Vinhall width to channel width ratio in the vicinity of said source that is greater than 0 and less than 0.98.

## 4,129,881
## HEAT SINK COOLED, SEMICONDUCTOR DEVICE ASSEMBLY HAVING LIQUID METAL INTERFACE

Pavel Reichel; Pavel Kafunek; Jiří Kovář; Oldrich Pokorný; Jaroslav Zůna; Jindřich Kratina, and Michal Pellant, all of Prague, Czechoslovakia, assignors to CKD Praha, oborovy podnik, Prague, Czechoslovakia

Filed Mar. 18, 1977, Ser. No. 778,869
Claims priority, application Czechoslovakia, Mar. 18, 1976, 1759-76
Int. Cl.[2] H01L *23/48, 29/40, 25/04*
U.S. Cl. 357—82 9 Claims



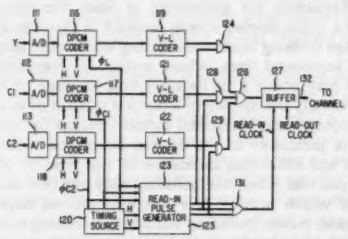
1. In a power semiconductor device construction, a substantially circular semiconductive wafer having first and second opposed planar surfaces, first and second cylindrical electrodes each having a first end wall and an internal, heat-dissipating wall partially bounded by a portion of the first end wall, the outer surfaces of the first end walls of the respective first and second electrodes bring individually disposed in confronting spaced relation to and coaxial with the first and second surfaces of the wafer, the outer surface of each first end wall of the respective electrodes having at least two reservoirs in the form of spaced concentric annular recesses disposed in a radially outer region thereof, and a highly conductive, flowable metallic layer disposed within each reservoir and filling the space between the outer surface of each first end wall and the confronting surface of the wafer over a considerable radial extent to effect efficient electrical and heat conduction between the wafer and the wells in the respective first electrodes, an insulating member disposed concentric with and radially outward of the peripheries of the respective first electrodes, and support means carried by the periphery of each first electrode for joining such electrode to the insulating member.

---

## 4,129,882
## VIDEO CODER FOR COLOR SIGNALS

John O. Limb, Tinton Falls, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 6, 1977, Ser. No. 794,361
Int. Cl.[2] H04N *9/02*
U.S. Cl. 358—13 6 Claims




1. A video encoder for use with a video information signal

including a luminance signal component and at least one chrominance signal component, the encoder comprising:

first means connected to receive and encode differences in the luminance signal component between successive samples along horizontal scan lines, and

second means connected to receive and encode differences in the chrominance signal component between samples in corresponding positions of two different horizontal scan lines that are alternating scan lines separated by an intermediate scan line, said second means indicating each quantum level by a signal representation;

third means for encoding the differences in the chrominance signal component between samples in corresponding positions of the intermediate scan line and one of the alternate scan lines into a predetermined number of quantum levels, said third means indicating each quantum level by a signal representation, and

gating means responsive to the signal representations corresponding to at least the quantum levels having the largest value magnitude, said gating means replacing the signal representation of said second means with that of said third means when the latter more accurately indicates the value of the corresponding sample of said intermediate scan line than one-half of the difference between corresponding samples of the alternate scan lines.

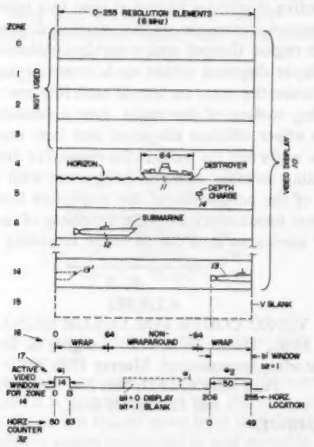
---

**4,129,883**

## APPARATUS FOR GENERATING AT LEAST ONE MOVING OBJECT ACROSS A VIDEO DISPLAY SCREEN WHERE WRAPAROUND OF THE OBJECT IS AVOIDED

**David R. Stubben, Santa Clara, Calif., assignor to Atari, Inc., Sunnyvale, Calif.**

**Filed Dec. 20, 1977, Ser. No. 862,680**
**Int. Cl.² H04N 7/18**
**U.S. Cl. 358—104** **5 Claims**




1. Apparatus for generating at least one moving object across a video display screen scanned in successive frames by an image forming beam transversing said screen along a plurality of horizontal lines, where undesired wraparound of said object may occur if its location near an edge of such screen requires only the display of a portion of such object said apparatus comprising: horizontal memory means for storing multibit data indicative of the desired horizontal location of said object and other bits indicative of the type of object to be displayed said other bits including only one of which is indicative of which portion of a wrapped around object is to be displayed; means including horizontal counting means responsive to said stored horizontal location and the location of said beam for providing an active video window signal indicative of the location of said object; and decoding logic means responsive to said window signal and said one bit to control the display of said object.

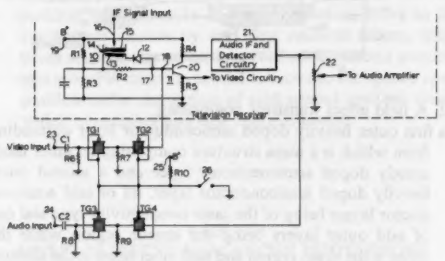
---

**4,129,884**

## SYSTEMS FOR SUPPLYING UNMODULATED BASEBAND SIGNALS TO TELEVISION RECEIVERS

**Patrick R. Anthony, Kitchener, Canada, assignor to Electrohome Limited, Kitchener, Canada**

**Filed Nov. 28, 1977, Ser. No. 855,381**
**Int. Cl.² H04N 5/44**
**U.S. Cl. 358—188** **6 Claims**




1. In combination with a television receiver having a video detector for pocessing video I.F. signals, said detector including a detector diode and an output terminal at which a detected video signal is derived, an amplifier having an input terminal, means connecting said input and output terminals, whereby said amplifier amplifies signals detected by said diode, apparatus for selectively supplying unmodulated video signals to said receiver from an external source, said apparatus including a signal input terminal adapted to receive said unmodulated video signals, a variable impedance device having a relatively high impedance in a first state thereof and a relatively low impedance in a second state thereof, means connecting said variable impedance device in circuit between said signal input terminal and said output terminal of said video detector, means for selectively varying the impedance of said variable impedance device between said first and second states thereof and means responsive to said variable impedance device being in said second state thereof for developing and applying to said detector diode a bias signal that biases said detector diode off, whereby when said variable impedance device is in said second state thereof said detector is clamped off and thus is unable to process said video I.F. signals while said unmodulated video signals are applied to said input terminal of said amplifier, in said first state of said variable impedance device said detector diode being biased for processing said video I.F. signals and said unmodulated video signals being isolated from said amplifier by the high impedance of said variable impedance device.

---

**4,129,885**

## WARM-UP COMPENSATION SYSTEM FOR PICTURE TUBE

**Donald D. Chovanec, Schaumberg, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.**

**Filed Oct. 3, 1977, Ser. No. 838,695**
**Int. Cl.² H04N 3/18**
**U.S. Cl. 358—190** **10 Claims**

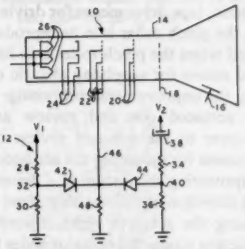
1. In a television receiver having a cathode ray tube whose brightness is a function of the bias potential between a control electrode and a cathode of the cathode ray tube, a device for reducing the interval between the initial energization of the cathode ray tube and the time at which the cathode ray tube reaches full brightness capability, comprising:

means for generating a nominal bias control voltage for application to the cathode ray tube;

means for generating a start-up bias control voltage for

application to the cathode ray tube, said start-up bias control voltage having at least an initial magnitude greater than the magnitude of said nominal bias control voltage; and

means for automatically coupling first and start-up bias



control voltage to the cathode ray tube and, after substantially full brightness capability has been achieved, decoupling the start-up bias control voltage and coupling the nominal bias control voltage thereto, whereby the cathode ray tube is quickly brought to substantially full brightness capability by the starting bias control voltage.

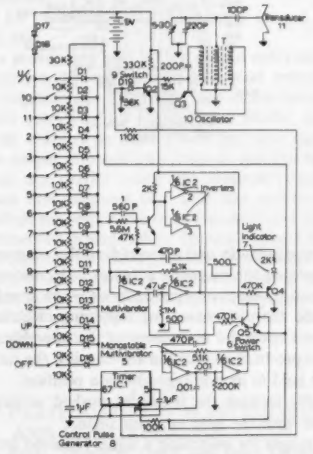
---

**4,129,886**

## DIGITAL REMOTE CONTROL SYSTEM

**Martin K. S. Shih, Kitchener, Canada, assignor to Electrohome Limited, Kitchener, Canada**

**Filed Mar. 1, 1976, Ser. No. 662,291**
**Int. Cl.[2] H04B *1/00***
**U.S. Cl. 358—194** **7 Claims**



1. In combination, signal receiving equipment adapted to receive and translate broadcast signals, said signal receiving equipment including information receiving and detecting means, said signal receiving equipment being operable in a plurality of different modes; a transmitter remotely located with respect to said signal receiving equipment, said transmitter including means for generating pulses having different discrete pulse widths, each pulse having a leading edge and a trailing edge, each pulse width corresponding to a different desired mode of operation of said signal receiving equipment, and means for transmitting said pulses; said information receiving and detecting means comprising means for receiving and detecting said pulses, trailing edge noise eliminating means and means for applying said received and detected pulses to said trailing edge noise eliminating means for eliminating noise pulses that may follow the trailing edges of the received and detected pulses; and means for controlling the mode of operation of said signal receiving equipment comprising means responsive to detection of pulses having different discrete pulse widths for automatically changing the mode of operation of said signal receiving equipment to modes of operation that are predetermined by the widths of said pulses detected by said detecting means.

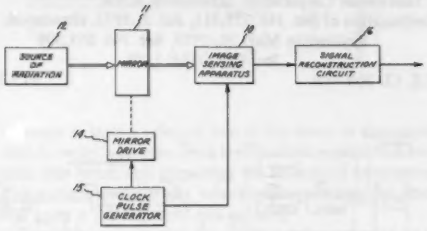
---

**4,129,887**

## SOLID STAGE IMAGING APPARATUS

**Gerald J. Michon, Waterford, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Oct. 31, 1977, Ser. No. 847,167**
**Int. Cl.[2] H04N *5/30, 5/33, 3/14***
**U.S. Cl. 358—213** **4 Claims**




1. In combination,

a substrate of semiconductor material of one type conductivity having a major surface,

first means forming a first plurality of charge storage sites for opposite type carriers adjacent said major surface of said substrate,

second means forming a second plurality of charge storage sites for opposite type carriers adjacent said major surface of said substrate, each coupled to a respective charge storage site of said first plurality to form a plurality of coupled pairs of charge storage sites,

said couple pairs of charge storage sites being arranged in an array of rows and columns,

a plurality of row conductor lines and a plurality of column conductor lines,

said first means including a first plurality of electrodes each insulatingly overlying a respective one of said storage sites of said first plurality, each of the electrodes of said first plurality in a respective row of sites being connected to a respective row line,

said second means including a second plurality of electrodes, each insulatingly overlying a respective one said storage sites of said second plurality, each of the electrodes of said second plurality in a respective column of sites being connected to a respective column line,

means for scanning a two-dimensional pattern of radiation having elements located in a matrix of columns and rows across said substrate in the column direction thereof at a substantially constant rate to produce a pattern of opposite type carriers of variable quantity in said plurality of storage sites,

said pattern of radiation having the same number of elements in a row as the number of storage sites in a row of storage sites, said pattern having a number of elements in a column exceeding the number of storage sites in a column of storage sites, the column to column spacing of said elements being equal to the column to column spacing of said storage sites, the row to row spacing of said elements being equal to the row to row spacing of said storage sites, a row of elements of said pattern of radiation scanning from a row of storage sites to an adjacent row of storage sites in a predetermined interval of time,

means for algebraically summing at the end of a predetermined interval of scan the quantities of opposite type carriers stored in each of said rows of storage sites with an agebraic summation code to derive a respective summation signal and thereafter injecting said quantities of opposite type carriers into said substrate, the quantity of opposite type carriers in each storage site being proportional to a respective element of said pattern of radiation,

the algebraic summation at the end of each successive interval of scan being in accordance with a respective successive algebraic summation code, said successive algebraic summation codes constituting a repeating one-dimensional transform.

---

**4,129,888**

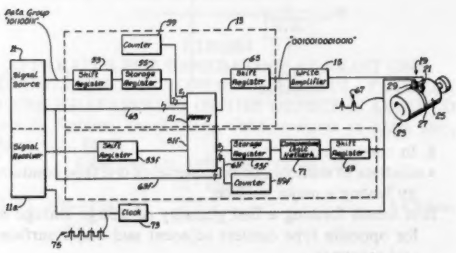
## DATA RECORDING AND/OR REPRODUCING SYSTEM

**William H. Reinholtz, San Gabriel, Calif., assignor to General Instrument Corporation, Hawthorne, Calif.**

**Continuation of Ser. No. 375,511, Jul. 2, 1973, abandoned. This application Mar. 24, 1975, Ser. No. 561,306**

**Int. Cl.[2] G11B** *5/09*

**U.S. Cl. 360—40** **31 Claims**




1. In combination for recording a data group having characteristics for expressing one of a particular number of first digital combinations, the data group including a first plurality of data bits each having digital information of first or second digital characteristics, comprising:

first means responsive to the data group for encoding the data group to provide for a second plurality of encoded signals greater in number by a particular factor than the data bits of the first plurality and including at least one data bit of the first digital characteristics with each digital bit of the first digital characteristics followed by a particular number of data bits of the second digital characteristics at least equal to the particular factor; and

second means responsive to the first means for recording the data bits produced by the first means.

---

**4,129,889**

## MAGNETIC RECORDING/REPRODUCING APPARATUS USING CASSETTE

**Itsuki Ban, 829, Higashioizumimachi, Nerimaku, Tokyo, and Kazunori Mochizuki, 6673 Oazahodaka, Hodakacho, Minamiazumi-gun, Nagano-gun, both of Japan**

**Filed May 23, 1977, Ser. No. 799,278**

**Claims priority, application Japan, May 29, 1976, 51-61794; Sep. 10, 1976, 51-107906; Nov. 1, 1976, 51-130471**

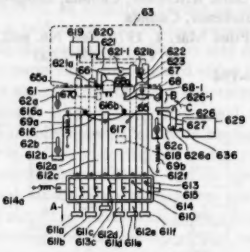
**Int. Cl.[2] G11B** *21/02, 15/46, 21/22*

**U.S. Cl. 360—75** **10 Claims**

1. In a magnetic recording/reproducing apparatus for a cassette magnetic tape which includes a non-reproduction mode including que and review operations, the apparatus comprising a deck, a movable plate mounted on the deck, means for moving the plate between reproduction and non-reproduction positions, first spring means for biasing the plate toward the reproduction position, a magnetic head mounted on the movable plate at a position where the magnetic head, when the movable plate is at the reproduction position, is in sliding contact with the magnetic tape, a capstan, a pinch roller mounted on the movable plate, mounting means on the movable plate for mounting the pinch roller for movement between a reproduction position in contact with the capstan and a non-reproduction position out of contact with the capstan, second spring means for biasing the pinch roller to the reproduction position, tape drive means for driving the tape at a play speed when the pinch roller is in its reproduction position and at a fast speed when the pinch roller is in its non-reproduction position, and means for supplying electric current to the tape drive means, the improvement comprising:

manually actuated que and review actuator slides for change-over to the que and review operations, respectively, means for mounting the actuator slides on the deck for reciprocating movement in a direction parallel to the moving direction of the movable plate, third spring means for biasing the actuator slides toward a position in the reproduction mode, the actuator slides being positioned to shift the movable plate to the non-reproduction position when one of the slides has been manually moved to a position in the non-reproduction mode,

a reciprocating magnetic actuator movable in one direction when the movable plate has been moved to the non-reproduction position by one of the actuating slides, the magnetic actuator being operatively connected with said movable plate,



an electromagnetic coil surrounding the magnetic actuator for holding the magnetic actuator in its non-reproduction position by electromagnetic force when supplied with an electric current, means for supplying electric current to the coil upon the movement of the movable plate to the non-reproduction position for causing the movable plate to be held in its non-reproduction position,

means for locking the manually pushed actuator slide together with the held movable plate,

switch means for switching a signal received from the magnetic head to the electromagnetic coil when the actuating slide is moved to its non-reproduction mode position,

circuit means including a time constant circuit interposed between the switch means and the electromagnetic coil for detecting blank zones on the magnetic tape when the switch means has been switched to the electromagnetic coil side,

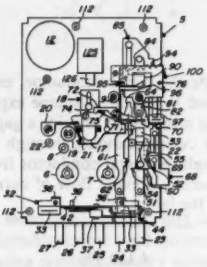
means responsive to the detection of the blank zones on the magnetic tape for turning off the electric current to said coil, and

means for releasing the actuating slide so that the third spring means will cause the slide to return to the reproduction position when the movable plate has been returned to the reproduction position by the first spring means when the electric current to said coil is turned off.

## 4,129,890
## MAGNETIC RECORDING AND REPRODUCING APPARATUS

Shoji Suzuki, Iwaki, Japan, assignor to Alps Motorola, Tokyo, Japan

Filed Sep. 26, 1977, Ser. No. 836,266
Claims priority, application Japan, Sep. 29, 1976, 51-116797
Int. Cl.[2] G11B *15/18*
U.S. Cl. 360—94 11 Claims



1. A magnetic recording and/or reproducing apparatus which is selectively applicable to utilize either a tape carrier of a first or second type and includes first and second tape capstans, said apparatus comprising:

an entryway into which tape carriers of said first and second type are to be inserted;

a first magnetic tape head located within said entryway for playing the tape contained in said first type tape carriers;

a second magnetic tape head located out of said entryway for reproducing the tape contained in said second type tape carriers;

a holder for receiving and conveying a second type tape carrier; and

means for positioning said holder in said entryway prior to the insertion of tape carriers into said entryway, said means responsive to a first type tape carrier being inserted into said entryway for moving said holder out of said entryway thereby permitting said first tape carrier to be pushed deeper into said entryway so that the tape in said first type tape carrier comes into cooperative engagement with said first magnetic tape head and said first capstan, and said means responsive to said second type tape carrier being received in said holder for moving said holder and second type carrier into a predetermined position substantially out of said entryway where the tape in said second type tape carrier comes into cooperative engagement with said second magnetic tape head and said second tape capstan out of said entryway.

---

## 4,129,891
## DOUBLE PARTITIONING OF FLEXIBLE DISK PACK AND ASSOCIATED APPARATUS

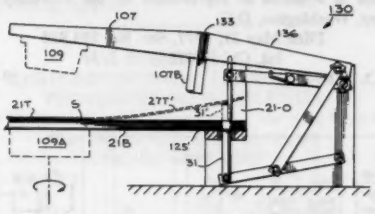
Herbert U. Ragle, Thousand Oaks, and Dean DeMoss, Camarillo, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 766,288, Feb. 7, 1977, which is a continuation-in-part of Ser. No. 720,905, Sep. 7, 1976. This application May 2, 1977, Ser. No. 792,589
The portion of the term of this patent subsequent to Apr. 25, 1995, has been disclaimed.
Int. Cl.[2] G11B *23/02, 25/04*
U.S. Cl. 360—98 18 Claims

1. In combination:

a partitionable, flexible disk pack comprising a stack of disks, each disk having an encoded arrangement of partition apertures and being arrayed in the stack so that predetermined apertures are registered from disk-to-disk, thereby generating at least two sets of "partition bores", each set originating from an opposite respective end of the stack and comprising bores of varying depths distributed circumferentially about the stack to terminate uniquely at a different respective disk surface; drive means adapted to rotate the stack; and

improved double-partitioning/centering means adapted to project at least one pair of thrust forces opposingly, to effect an "end-wise partitioning", axially of the stack and normal to a major surface of the disks, each force being directed against a selected disk surface from an opposite respective end of the stack and adpated to be applied



through at least a selected one of the bores in the associated bore set when the stack is rotated to register this bore with this force, and impacting the associated terminating disk-surface deflectingly whereby to partition the stack and open a gap adjacent this surface;

said partitioning/centering means thus being adapted to so deflect the disks divergingly as to define a partition-gap as well as to "center" the "selected" disk diposed in this gap intermediate the impacted disk;

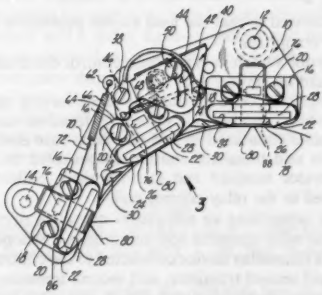
said drive means being arranged and controlled to accommodate this partitioning.

---

## 4,129,892
## BACK-UP PRESSURE MECHANISM WITH TENSIONED ELONGATED MEMBER

Abdul L. Kasu, Livonia, and Jerry I. Tustaniwskyj, Warren, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Dec. 19, 1977, Ser. No. 861,978
Int. Cl.[2] G11B *15/60, 5/10*
U.S. Cl. 360—130 6 Claims



1. A demountable back-up pressure mechanism for a high speed read/write device having two or more acruately displaced electromagnetic read/with transducer members comprising:

an elongated, flexible, non-magnetic member including means mounting said elongated member adjacent said transducer members effective thereby to provide constant uniform back-up pressure for the active portion of said transducers,

means operably associated with said elongated non-magnetic

member for selectively placing said member under tension effective to rigidify and flatten said member adjacent to said transducer members, and

means for locking said elongated member in said tensioned condition and for releasing said elongated member from said tensioned condition for repair or replacement.

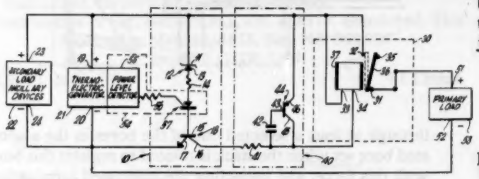
---

**4,129,893**

## THERMOELECTRIC GENERATOR OVERLOAD PROTECTIVE DEVICE USING HYSTERISIS CONTROL

**Joseph P. Angello, Eatontown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed May 31, 1977, Ser. No. 801,938**
**Int. Cl.[2] H02H** *7/06, 3/24*
**U.S. Cl. 361—21** **10 Claims**




1. An overload protection system including a generator, a load switch protective device and a primary load to which the generator is normally connected and from which it is disconnected upon an overload condition by the load switch protective device, and a secondary load,

wherein the generator has first and second output terminals connected to the protective device and connected to the secondary load to which secondary load said output terminals remain connected even after being disconnected from the primary load by the protective device,

wherein said protective device is connected to the primary load,

wherein the load switch protective device comprises a relay having a control coil and a set of contacts having open and close positions and controlled by the control coil, the close contact position of the set of contacts connecting the primary load to the generator and their open contact position disconnecting the generator from the primary load,

characterized in that the load switch protective device further comprises

a transistor switch having a base control electrode, a collector and an emitter and

a voltage selectable breakdown diode having one terminal connected to the first generator terminal and its other terminal connected to said transistor base electrode,

wherein said transistor emitter is connected to the second generator terminal and said transistor collector is connected to the relay control coil;

further comprising an anti-clatter circuit to prevent clatter of the relay contacts and comprising a second transistor and a time delay device connected to the control electrode of said second transistor, said second transistor having its collector-emitter in parallel with said relay coil.

---

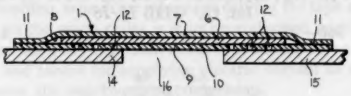
**4,129,894**

## LAMINATED CURRENT SURGE PROTECTOR

**Keith A. Chen, Milwaukee, Wis., assignor to Wisconsin Gas Company, Milwaukee, Wis.**

**Filed Jul. 7, 1977, Ser. No. 813,536**
**Int. Cl.[2] H01T** *1/00*
**U.S. Cl. 361—117** **6 Claims**

1. A laminated current surge protector to protect metal members separated at a joint therebetween by an insulating medium, which comprises a flexible, conformable arrestor extending across the joint and adhered to the outer surfaces of the respective metal members, said arrestor having a metal conductor, a weather resistant coating adhered to the outer surface of the conductor, a durable tape adhered to the inner surface of the conductor and said coating and tape being disposed to encapsulate the metal conductor, and a plurality of perforations disposed in the durable tape exposed to each of the respective metal members to provide a gap through which excessive surges of current flowing through the metal members can pass through the metal conductor from one member to the other and thereby prevent flow of current through the joint and injury to the latter.



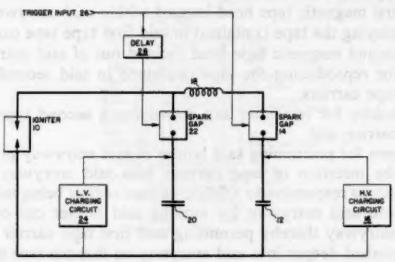

---

**4,129,895**

## CURRENT WAVE SHAPES FOR JET ENGINE FUEL IGNITERS

**Harald L. Witting, Burnt Hills, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Feb. 22, 1977, Ser. No. 770,508**
**Int. Cl.[2] H01T** *15/02*
**U.S. Cl. 361—257** **11 Claims**




1. An exciter for energizing a fuel igniter comprising:

means for initiating an electric discharge pulse across contacts of the igniter at an initial current level of sufficient magnitude to cause the discharge to separate and move away from a surface of the igniter; and

means for increasing the power in the discharge, which means function to increase the current level in the discharge following a time delay of between approximately 20 microseconds and approximately 40 microseconds after initiation of the discharge, said level being sufficient to insure ignition of an air-fuel mixture.

---

**4,129,896**

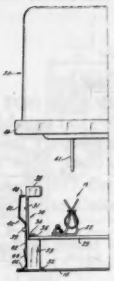
## METER RETAINER

**John W. Young, Lawrenceville, Ga., assignor to Gould Inc., Rolling Meadows, Ill.**

**Filed Nov. 1, 1977, Ser. No. 847,554**
**Int. Cl.[2] H02B** *9/00*
**U.S. Cl. 361—371** **11 Claims**

1. A ringless-type socket device for a watt hour meter or the like, said socket including a plurality of plug-in contacts operatively positioned at a contact region to be engaged by rearwardly extending cooperating plug-in contacts of a watt hour meter when same is mounted to said device in front of said contact region, said socket also including support means having at its forward end seat means operatively positioned to be engaged by a watt hour meter when same is mounted to said

device to limit rearward movement of the latter, spring retainer means mounted on said support means and having at its forward end holding means operable to a holding position forward of said seat means to block forward movement of a



watt hour when same is mounted to said device, said retainer means being deflectable for outward movement of said holding means to a releasing position thereby permitting a watt hour meter when same is mounted to said device to be dismounted therefrom.

---

**4,129,897**

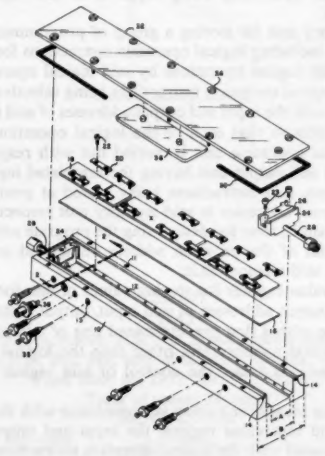
## MODULAR MOUNTING APPARATUS FOR SUBSTRATE MEANS BEARING PLANAR CIRCUIT MEANS

**Fred J. Telewski; Carlos L. Beeck, and Philip B. Snow, all of Beaverton, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.**

**Continuation of Ser. No. 633,742, Nov. 20, 1975, abandoned. This application Jan. 18, 1978, Ser. No. 870,302**

**Int. Cl.[2] H05K *1/04***

**U.S. Cl. 361—399** **4 Claims**



1. A modular package in which planar circuit means are mounted, comprising:

housing means having side walls and a bottom defining a channel-shaped configuration and having a predetermined variable length;

elastomeric conduction means in engagement with said bottom and extending substantially along the length thereof;

substrate means containing planar circuit means on at least the upper surface means thereof and ground circuit means provided on the bottom surface thereof, said ground circuit means electrically engaging said elastomeric conduction means;

removable substrate securing means extending between said housing means and said substrate means urging said ground circuit means into electrical connection with said elastomeric conduction means and said elastomeric conduction means providing cushion means therefor;

removable connection means provided by said housing means electrically connected respectively to said planar circuit means on said upper surface means and to said ground circuit means on said lower surface means; and

means sealing said substrate means so as to be free from interfering signals.

---

**4,129,898**

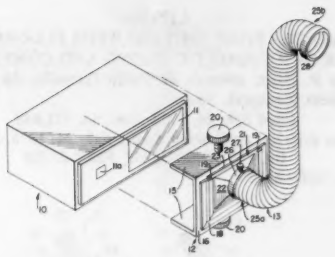
## LIGHT-DIVERTING ATTACHMENT FOR PHOTOGRAPHIC FLASH UNITS

**Charles L. Ohrstedt, 66 E. Tulane Rd., Columbus, Ohio 43202**

**Filed Dec. 6, 1976, Ser. No. 747,555**

**Int. Cl.[2] G03B *15/02***

**U.S. Cl. 362—7** **1 Claim**



1. A light-diverting attachment for a photoflash unit having a light-emitting aperture, comprising:

(a) a mounting bracket for quickly detachable external connection to a photoflash unit and having an opening for registration with the light-emitting aperture of the photoflash unit and a channel-forming flange disposed in surrounding relation to said opening; and

(b) an elongated, hollow, bendable tube having an open, light-transmitting passage extending therethrough and a proximal end portion provided with a connector frame detachably engaged with the channel-forming flange of said mounting bracket in surrounding relation to the opening thereof and a distal, light-projecting end portion extending remotely from said mounting bracket, said tube being normally shape-retentive, but being manually bendable to locate the light-projecting end portion thereof at various axially offset positions with respect to the opening of said mounting bracket and the light-emitting aperture of the photoflash unit.

---

**4,129,899**

## FLASHLIGHT WITH A ROTATABLE LAMP HOLDER

**George W. Dunbar, P.O. Box 8072, J.F.K. Sta., Boston, Mass. 02108**

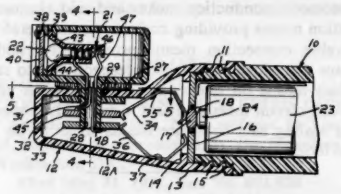
**Continuation-in-part of Ser. No. 629,506, Nov. 6, 1975, abandoned. This application Oct. 6, 1977, Ser. No. 840,020**

**Int. Cl.[2] F21V *33/00***

**U.S. Cl. 362—109** **12 Claims**

1. A flashlight including a battery-receiving hollow casing including a head portion and rear portion dimensioned to accommodate at least one battery, a lamp holder having an optically open end and including a lamp socket, and a rotatable connection between said head portion and said holder enabling said holder to turn in a fore and aft direction with said optically open end at right angles to the axis of said connection, said flashlight including a switch controlled battery circuit in

which a battery, when within the rear portion, is included and which includes sections in the head portion, each section including a contact, and said lamp holder including a pair of sections each including first and second contacts, the first



contacts placing the lamp in the battery circuit when the lamp in said socket and the second contacts are in engagement with the appropriate one of said contacts of said sections as the holder turns, said second lamp socket contacts carried by said rotatable connection.

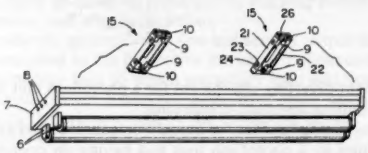
---

**4,129,900**

## APPARATUS FOR LIGHTING WITH FLUORESCENT TUBES OF AUTOMATIC FIXING AND CONNECTION

**Eduardo P. Sanz, Avenida de Pablo Gargallo, 46-48 (Sector Quimica), Zaragoza, Spain**

**Filed Feb. 24, 1977, Ser. No. 771,648**
**Claims priority, application Spain, Feb. 24, 1976, 219042**
**Int. Cl.[2] H05B *33/02*; F21V *21/08***
**U.S. Cl. 362—217** **1 Claim**



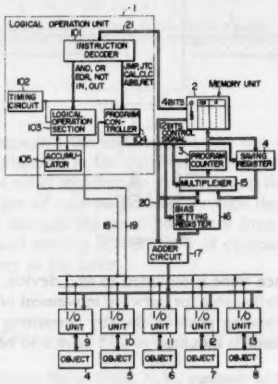
1. An apparatus for fluorescent lighting, comprising an elongated channellike housing having a pair of side flanges, said housing being adapted to be disposed in a first orientation wherein same opens upwardly for mounting on a ceiling, said housing being adapted to be mounted in a second orientation wherein it opens downwardly, a pair of lampholders slidably disposed within the housing adjacent the opposite ends thereof, a pair of end covers receivable within the opposite ends of said housing, said lampholders and said covers coacting with the opposite side flanges for holding the covers and the lampholders on the housing, said covers and said lampholders being inverted relative to said housing when the latter is converted for use from said first orientation to said second orientation and vice versa, and a pair of mounting racks adapted to be secured to the ceiling for releasably supporting said housing when the latter is in said first orientation, each mounting rack including a pair of insulated lugs spring urged outwardly in opposite directions and having camming means on the outer ends thereof adapted for engagement with the flanges of said housing, each of said lugs having electrical contact means associated therewith and positioned for engaging a cooperating electrical contact means mounted on the inside of the flanges of said housing.

**4,129,901**

## PLURAL-SEQUENCE CONTROL SYSTEM

**Ikuro Masuda, Hitachi, Japan, assignor to Hitachi, Ltd., Japan**

**Filed Apr. 5, 1977, Ser. No. 784,810**
**Claims priority, application Japan, Apr. 9, 1976, 51-39197**
**Int. Cl.[2] G05B *11/00*; G06F *9/16***
**U.S. Cl. 364—104** **5 Claims**



1. A sequence control system for controlling a plurality of external devices, comprising:

a plurality of input/output units for receiving, as inputs, quantities representative of states of said devices and providing outputs to said devices, said objects being assigned with predetermined input and output addresses respectively;

a logical operation unit for receiving said quantities representative of the states of the respective devices to perform logical operations on said quantities, the results of the logical operations being supplied to said input/output units;

a memory unit for storing a group of programmed instructions including logical operation instructions for performing the logical operations by said logical operation unit, the logical operation instructions being selectively associated with the input and output addresses of said input/output units so that each of the logical operations by said logical operation unit is carried out with respect to the input and output unit having the associated input/output address, said instructions being stored at predetermined program addresses in said memory unit respectively;

a program counter for designating the program addresses for readout of the program address designated instructions from said memory unit;

a bias value register for storing values of bias for the input and output addresses of said input/output units in accordance with a first predetermined one of said instructions from said memory unit other than the logical operation instructions under the control of said logical operation unit;

selecting means for biasing in accordance with the contents of said bias value register the input and output address associated with the logical operation instruction from said memory unit to select one of said input/output units corresponding to the biased input and output address; and

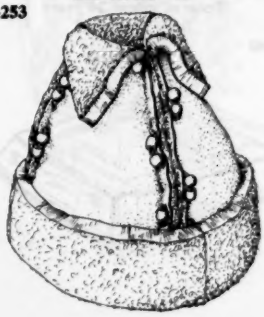
a saving register for temporarily saving during an interrupt the contents of said program counter for later return under the control of said logical operation unit.

# DESIGNS

## DECEMBER 12, 1978

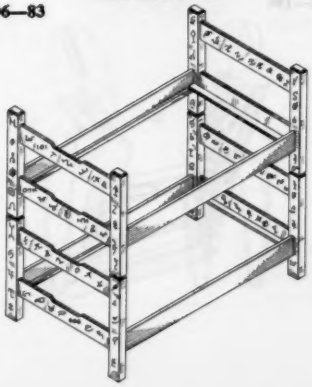
**250,496**
**HEAD SEAL FOR AN ANTI-DUST HELMET**
Raymond Odell, 184 Mutton La., Potters Bar, Herts., and Brian A. Lowe, 6 Beaumont View, Appleby St., Cheshunt, Herts., both of England
Filed Jan. 7, 1977, Ser. No. 757,562
Claims priority, application United Kingdom, Aug. 8, 1976, 976849/76
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—233

**250,497**
**HAT**
Georges A. Rocheleau, R.R. No. 1, and Florien Rouillard, R.R. No. 1, P.O. Box 541, both of Bedford, Quebec, Canada
Filed Mar. 30, 1977, Ser. No. 783,058
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—253

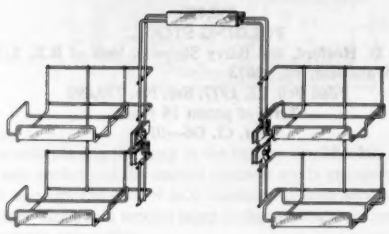


**250,498**
**FOLDING STOOL**
Charles D. Hosford, and Barry Simpson, both of R.R. 1, Box 122, Waitsfield, Va. 05673
Filed Feb. 22, 1977, Ser. No. 770,892
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—32

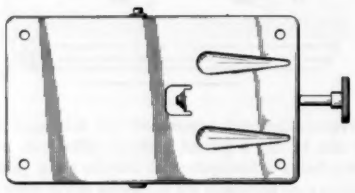
**250,499**
**BUNK BED**
Ray J. O'Gwin, Jr., 4201 Dyer, El Paso, Tex. 79930, and Emmett D. McIntyre, 412 Butte Clr., El Paso, Tex. 79902
Filed Aug. 1, 1975, Ser. No. 601,216
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—83



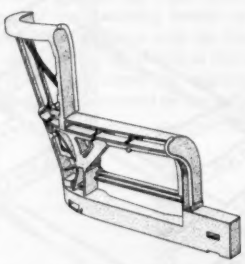
250,500
DISPLAY RACK
Philip Marks, 1009 Fifth Ave., New York, N.Y. 10028
Filed Sep. 20, 1976, Ser. No. 725,050
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—85



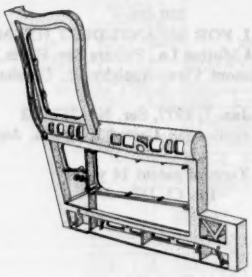
250,501
COMPACT CHAIR-TILTING CONTROL
Lon W. Pinaire, Prospect, Ky., and Robert H. Godwin, Evansville, Ind., assignors to Bliss & Laughlin Industries Incorporated, Oak Brook, Ill.
Filed Jun. 2, 1975, Ser. No. 582,643
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191



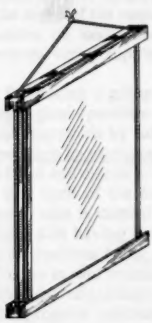
250,502
FURNITURE SUBFRAME
David C. Trimble, Yorklyn, Del., assignor to Hercules Incorporated, Wilmington, Del.
Filed Apr. 12, 1977, Ser. No. 786,901
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—195



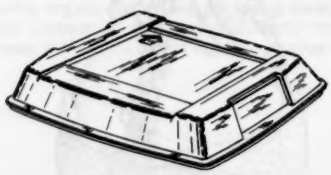
250,503
FURNITURE SUBFRAME
William M. Colatriano, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.
Filed May 4, 1977, Ser. No. 793,695
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—195



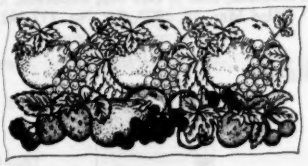
250,504
PICTURE FRAME
Jules Kliot, 2150 Stuart St., Berkeley, Calif. 94705
Filed Feb. 3, 1977, Ser. No. 765,278
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—242



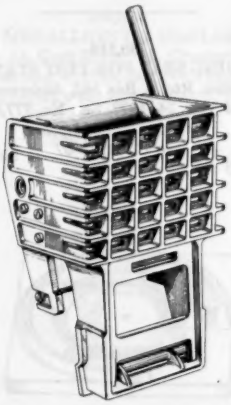
250,505
INSULATED COVER FOR A FOOD TRAY OR THE LIKE
Richard H. Seager, Manchester, Conn., assignor to King-Seeley Thermos Company
Filed Oct. 18, 1976, Ser. No. 733,040
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—40



250,506
CONDIMENT SHAKER OR SIMILAR ARTICLE
Peter A. Gobleck, Jr., Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Division of Ser. No. 659,966, Feb. 20, 1976. This application Mar. 14, 1977, Ser. No. 776,969
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—54

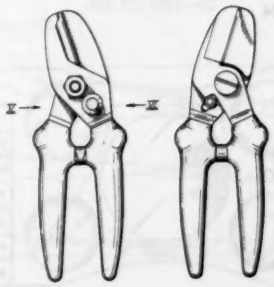


250,507
MOP WRINGER
William B. Raftery, 4089-9 Pine Creek Rd., Grandville, Mich. 49418; Dale T. Maza, 144 Fox Dr., and Glen E. Tomblin, 141 Allison Ave., both of Winchester, Va. 22601
Filed Dec. 9, 1976, Ser. No. 748,811
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—187

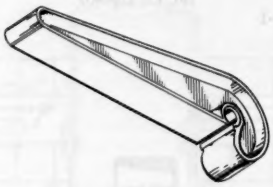


250,508
SHAFT COUPLING FOR GARDEN TOOLS
Franco Clivio, and Dieter Raffler, both of Ulm, Fed. Rep. of Germany, assignors to Gardena kress & Kastner GmbH, Fed. Rep. of Germany
Filed Dec. 15, 1976, Ser. No. 750,763
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1976, M744
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—1

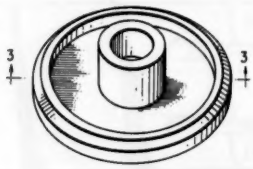
250,509
PAIR OF SECATEURS
Frederick W. Plimmer, Cowbridge, Wales, assignor to Wilkinson Sword Limited
Filed Aug. 6, 1976, Ser. No. 712,316
Claims priority, application United Kingdom, Feb. 6, 1976, 974376/76; May 11, 1976, 975585/76
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—5



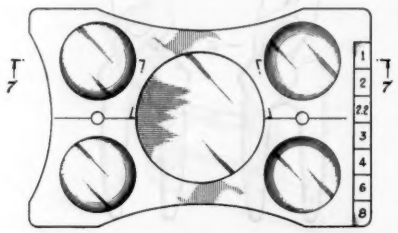
250,510
OPENING TOOL FOR TEAR-OPEN-TYPE CONTAINERS
Albert F. Bujan, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.
Filed Jul. 29, 1976, Ser. No. 709,759
Term of patent 14 years
Int. Cl. D7—*99, 06*
U.S. Cl. D8—40



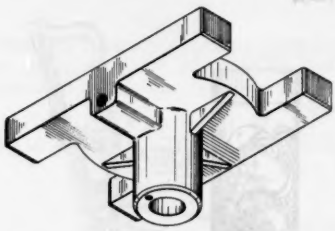
250,511
SEALING LINER FOR A CLOSURE
Lyle C. Affleck, 47 Ormond St., Ashfield, New South Wales 2131, Australia
Filed Mar. 15, 1976, Ser. No. 667,783
Claims priority, application Australia, Sep. 26, 1975, 67839/75
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—254



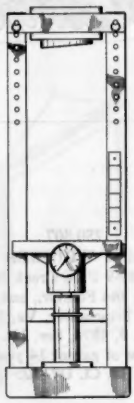
250,512
LENS CALIBRATION GAUGE
Irving Rips, Beverly Hills, and Kemper H. Vine, Santa Monica, both of Calif., assignors to Younger Manufacturing Company, Los Angeles, Calif.
Filed Oct. 28, 1976, Ser. No. 736,438
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—64



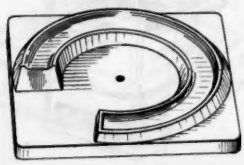
250,513
GAUGE MOUNT SLIDE FOR TEST STAND
Richard C. Etchison, Rte. 6, Box 342, Anderson, Ind. 46011
Filed Mar. 14, 1977, Ser. No. 777,091
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—83



250,514
COIL SPRING TEST STAND
Richard C. Etchison, Rte. 6, Box 342, Anderson, Ind. 46011
Filed Mar. 14, 1977, Ser. No. 777,092
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—83



250,515
SPRING SEAT FOR TEST STAND
Richard C. Etchison, Rte. 6, Box 342, Anderson, Ind. 46011
Filed Mar. 14, 1977, Ser. No. 777,093
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—83



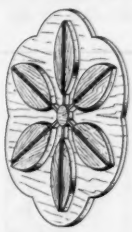
250,516
EARRING
Martin B. Fishman, 765 Massachusetts Ave., Cambridge, Mass. 02139
Filed Dec. 2, 1977, Ser. No. 856,924
Term of patent 7 years
Int. Cl. D11—*01*
U.S. Cl. D11—49

250,517
EARRING
Martin Fishman, 765 Massachusetts Ave., Cambridge, Mass. 02139
Filed Dec. 2, 1977, Ser. No. 856,921
Term of patent 7 years
Int. Cl. D11—*01*
U.S. Cl. D11—67

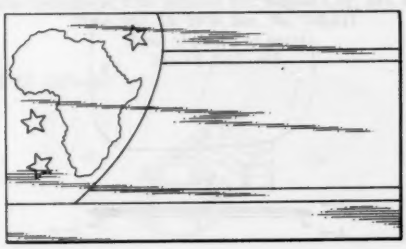
250,518
JEWELRY MEDALLION OR SIMILAR ARTICLE
David Friedman, 22, Gush Etzion St., Givatayim, Israel
Filed Aug. 4, 1976, Ser. No. 711,524
Claims priority, application Israel, Mar. 5, 1976, 6334
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—108

250,519
ARTIFICIAL TREE
Hideo Hashimoto, P.O. Box 1182, 2618 Desert St., 12, Rosamond, Calif. 93560
Filed Oct. 14, 1976, Ser. No. 732,363
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D11—118

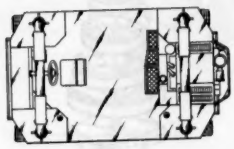
250,520
PLAQUE
Paul R. Heavener, 1122 W. 166th St., Gardena, Calif. 90247
Filed May 31, 1977, Ser. No. 795,318
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—140

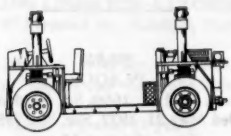


250,521
FLAG
Charles E. McCraney, 1831 S. 22nd Ave., Maywood, Ill. 60153
Filed Jul. 1, 1976, Ser. No. 701,544
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D11—176

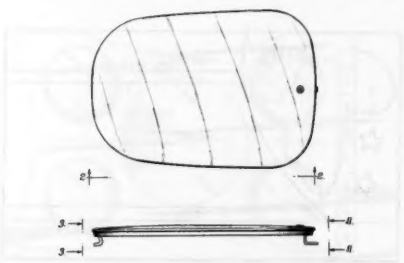


250,522
**SELF-PROPELLED PERSONNEL AND MATERIAL CARRYING VEHICLE**
Earl L. Miner, Long Lane, and Harold G. Jones, Lebanon, both of Mo., assignors to Detroit Tool and Engineering Company, Lebanon, Mo.
Filed Dec. 20, 1976, Ser. No. 752,256
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D12—1



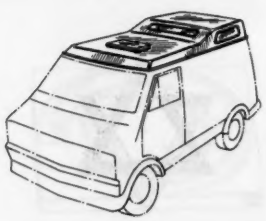


250,523
**PROTECTIVE SECURITY HATCH COVER FOR SAILBOATS OR THE LIKE**
John A. MacIntyre, 305 E. Prospect Ave., Lake Bluff, Ill. 60044
Filed Jul. 19, 1976, Ser. No. 706,692
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—70

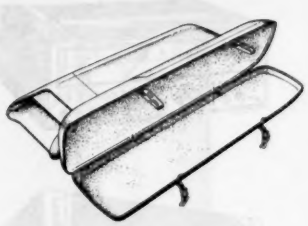


250,524
**TIRE**
Raimo Nyblom, Nokia, Finland, assignor to Oy Nokia AB, Helsinki, Finland
Filed Oct. 28, 1977, Ser. No. 846,400
Claims priority, application Finland, Apr. 28, 1977, 291/77
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146

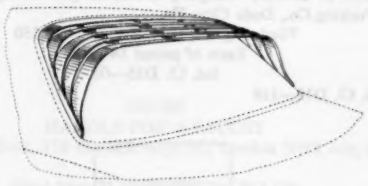
250,525
**VAN TOP**
Stanley G. Snyder, 1993 Belmont Ct., El Cajon, Calif. 92020
Filed Nov. 30, 1977, Ser. No. 855,900
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—156



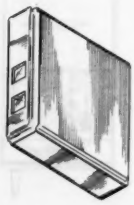
250,526
CAR TOP CARRIER FOR WINTER SPORTS EQUIPMENT
Werner Breitschwerdt, Stuttgart, and Andreas Langenbeck, Sindelfingen, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany
Filed Sep. 14, 1977, Ser. No. 833,382
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1977, 4635
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—157



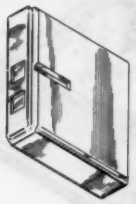
250,527
AIR GUIDE FOR MOTOR VEHICLE REAR WINDOWS
Bruno Sacco, Sindelfingen, and Hans Götz, Böblingen, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany
Filed Mar. 16, 1977, Ser. No. 778,142
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1976, 4568
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—181



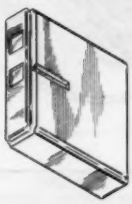
250,528
ELECTRIC CARTRIDGE BATTERY
Gordon E. Kaye, Garrison, N.Y., assignor to P.R. Mallory & Co. Inc., Indianapolis, Ind.
Filed May 5, 1977, Ser. No. 793,825
The portion of the term of this patent subsequent to Mar. 18, 1991, has been disclaimed.
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D13—8



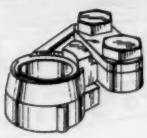
250,529
ELECTRIC CARTRIDGE BATTERY
Gordon E. Kaye, Garrison, N.Y., assignor to P.R. Mallory & Co. Inc., Indianapolis, Ind.
Filed May 5, 1977, Ser. No. 793,826
The portion of the term of this patent subsequent to Mar. 18, 1991, has been disclaimed.
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D13—8



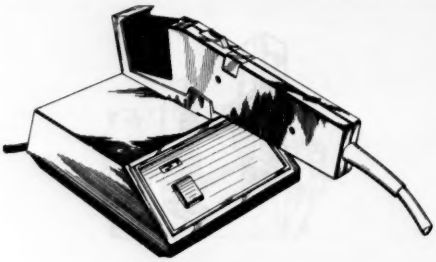
250,530
ELECTRIC CARTRIDGE BATTERY
Gordon E. Kaye, Garrison, N.Y., assignor to P.R. Mallory & Co. Inc., Indianapolis, Ind.
Filed May 5, 1977, Ser. No. 793,999
The portion of the term of this patent subsequent to Mar. 18, 1991, has been disclaimed.
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D13—8



250,531
BATTERY TERMINAL CONNECTOR
James Demetreon, 5704 Hillside Dr., Kansas City, Mo. 64151
Filed Nov. 10, 1976, Ser. No. 740,611
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D13—10

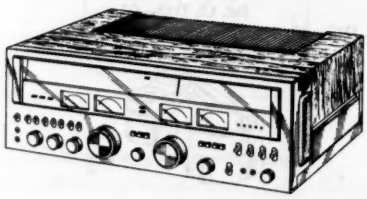


250,532
DICTATION STATION OR THE LIKE
David K. Walz, Atlanta, Ga., assignor to Lanier Business Products, Inc., Atlanta, Ga.
Filed Sep. 24, 1976, Ser. No. 726,253
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—3

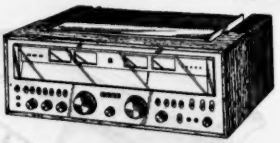


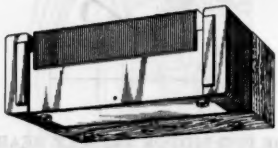
250,533
AUTOMATIC TELEPHONE DIALER
Marc Renard, Pierrefitte, France, assignor to Societe Peritel S.A.R.L., Boulogne, France
Filed Jan. 26, 1977, Ser. No. 762,638
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—66

250,534
COMBINED TUNER AND AMPLIFIER
Akira Kato, Chofu, Japan, assignor to Sansui Electric Co., Ltd., Tokyo, Japan
Filed Mar. 9, 1977, Ser. No. 776,045
Claims priority, application Japan, Sep. 13, 1976, 51/36208
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—96



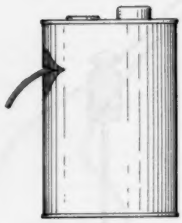
250,535
COMBINED TUNER AND AMPLIFIER
Akira Kato, Chofu, Japan, assignor to Sansui Electric Co., Ltd., Tokyo, Japan
Filed Mar. 9, 1977, Ser. No. 776,049
Claims priority, application Japan, Sep. 13, 1976, 51/36207
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—96





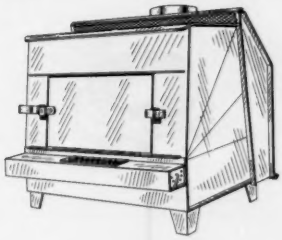
250,536
BEVERAGE DISPENSER
Robert E. Bourke, Westport, Conn., assignor to Lykes Pasco Packing Co., Dade City, Fla.
Filed Aug. 27, 1976, Ser. No. 718,150
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—116

250,537
MOISTENER FOR STAMP OR THE LIKE
Ronald M. Stephens, 305 - 1400 Camosun, Victoria, B. C., Canada (V8V 4L4)
Filed Dec. 8, 1976, Ser. No. 748,775
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—70

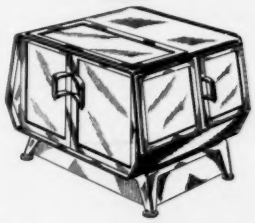


250,538
HANDLE FOR A FAUCET
Victor R. Hart, 156 Camden High St., London NW1 one, England
Filed May 31, 1977, Ser. No. 802,288
Claims priority, application United Kingdom, Dec. 10, 1976, 978209/76
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—28

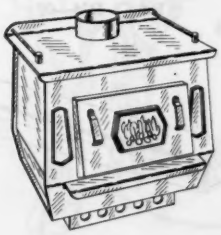
250,539
FREE STANDING STOVE
Norman W. Twiss, Box 486, Star Route, and Norman W. Twiss, Box 525, Star Route, both of Gales Creek, Oreg. 97117
Filed Jul. 11, 1977, Ser. No. 811,521
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



250,540
WOOD-BURNING STOVE
Arthur J. Luscombe, Dolliver, Iowa 50531
Filed Jun. 30, 1977, Ser. No. 811,998
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97

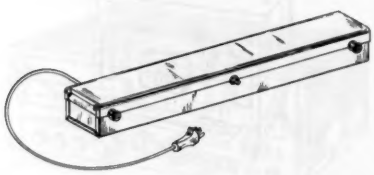


250,541
WOOD BURNING STOVE WITH DOOR
Roger A. Chinn; Edna A. Chinn, both of Tigard; John E. Blaser, Tualatin, and Keith N. Bender, Aloha, all of Oreg., assignors to Woodcutter's Manufacturing, Inc.
Filed Oct. 14, 1977, Ser. No. 842,376
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



250,542
CONTAINER FOR SOLID AIR FRESHENER
Hisao Murakami, Fukae-minamimachi, Japan, assignor to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan
Filed Nov. 14, 1977, Ser. No. 851,421
Claims priority, application Japan, May 13, 1977, 52/18399
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150

250,543
LIQUID STERILIZER ASSEMBLY
James H. Lewis, 68 Glass Ave., London, Ontario, N5W 1Z7, Canada
Filed Aug. 2, 1976, Ser. No. 710,362
Claims priority, application Canada, Feb. 5, 1976, 05-02-76-3
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—9



250,544
DENTAL ROOT-CANAL BROACH
Henri Leonard, Besancon, France, assignor to Micro-Mega S.A.
Filed Jan. 4, 1977, Ser. No. 756,606
Claims priority, application France, Jul. 9, 1976, 76 1117
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—10

250,545
TEAT
Eric K. Hurst, London, England, assignor to Lewis Woolf Griptight Limited, Birmingham, England
Filed Sep. 5, 1975, Ser. No. 610,896
Claims priority, application United Kingdom, Jun. 14, 1975, 971493/75
Term of patent 14 years
Int. Cl. D28—*01*; D24—*04*
U.S. Cl. D24—47

250,546

## DOUCHE APPLIANCE

Ernest W. Pick, Cos Cob; Joseph M. Denaro, Stamford, and Henry R. Goerke, Norwalk, all of Conn., assignors to The Purdue Frederick Company, New York, N.Y.

Filed Sep. 8, 1977, Ser. No. 831,596
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—60

250,547

## RAZOR

Thomas E. Palmer, Cramlington, England, assignor to Wilkinson Sword Limited

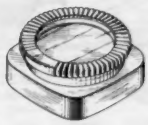
Filed Mar. 8, 1977, Ser. No. 775,570
Claims priority, application United Kingdom, Sep. 9, 1976, 977078/76
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—46

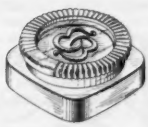
250,548

## MAKE-UP CASE

Gabriele Rost, Elisabethenstr. 62, D-6050 Offenbach, Fed. Rep. of Germany

Filed Mar. 17, 1977, Ser. No. 778,568
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1976, 73MR8545
Term of patent 7 years
Int. Cl. D3—*01*
U.S. Cl. D28—79



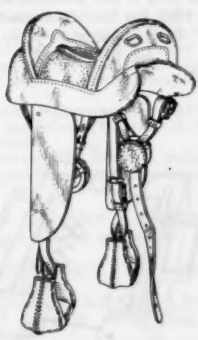


250,549

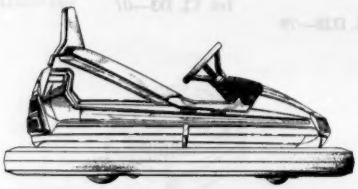
## SADDLE

Charles W. Stoddard, 1040 Fitzgerald Ave., Gilroy, Calif. 95020

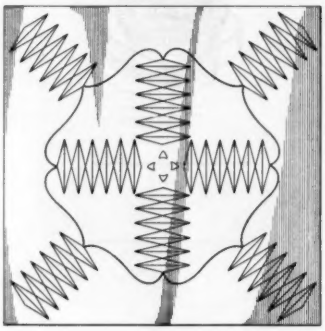
Filed Oct. 4, 1976, Ser. No. 729,080
Term of patent 14 years
Int. Cl. D30—*04*
U.S. Cl. D30—20



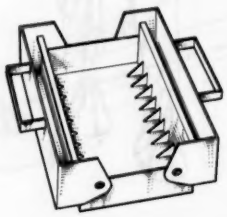
250,550
AMUSEMENT BUMPER CAR
Gaston Reverchon, Route de Courbuisson, Samois 77920, France
Filed Sep. 8, 1976, Ser. No. 721,415
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 L



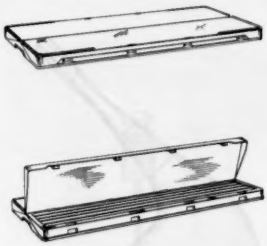
250,551
GAMEBOARD
Martin Normart, 36 Garfield Ave., Norwood, Pa. 19074
Filed Feb. 23, 1977, Ser. No. 771,192
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



250,552
CARRYING CASE FOR TAPE CASSETTES
Ole Winther, Helsingör, Denmark, assignor to Esselte Obergs AB, Stockholm, Sweden
Filed Aug. 11, 1976, Ser. No. 713,551
Claims priority, application Sweden, Feb. 16, 1976, 760362
The portion of the term of this patent subsequent to Apr. 18, 1992, has been disclaimed.
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 D

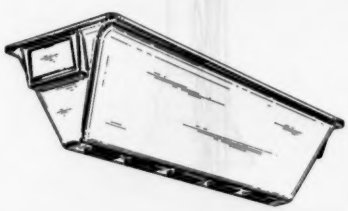


250,553
GEOLOGICAL SPECIMEN CASE
Jon Myhre, Stjordal, Norway, assignor to Fangel & Co. A/S, Oslo, Norway
Continuation-in-part of Ser. No. 822,830, Aug. 8, 1977, abandoned. This application Jan. 16, 1978, Ser. No. 869,925
Claims priority, application Norway, Feb. 9, 1977, 7758062
Term of patent 3½ years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R



250,554
CANE
Sheila Hardy, 106 S. Western Ave., Bartlett, Ill. 60103
Filed Jun. 17, 1976, Ser. No. 696,885
Term of patent 14 years
Int. Cl. D3—*03*
U.S. Cl. D88—5

250,555
ILLUMINATED OVERHEAD ADVERTISING DISPLAY
Paul Belokin, Jr., R.R. #4, Hayward, Wis. 54843
Filed Jul. 20, 1977, Ser. No. 817,127
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12 R



# LIST OF PATENTEES

## TO WHOM

## PATENTS WERE ISSUED ON THE 12TH DAY OF DECEMBER, 1978

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Nattermann & Cie. GmbH: *See*—
Betzing, Hans; and Lekim, Dac, 4,129,650, Cl. 424-211.000.

AB Volvo Penta: *See*—
Pichl, Heinz, 4,129,103, Cl. 123-52.00R.

AB Ziristor: *See*—
Knutsson, Kent I., 4,129,467, Cl. 156-84.000.

Abate, Giorgio, to Solai Vignola di Fabiani Orlando e C. - Societa in nome collettivo. Prefabricated building components of expanded material and cement. 4,128,975, Cl. 52-125.000.

Abdallah, Nessib, to Civil & Civic Pty. Limited. Reinforced concrete construction. 4,128,980, Cl. 52-251.000.

Abex Corporation: *See*—
Ridenour, Charles E.; Fabert, Herman A., Jr.; Tasker, John; and Larson, Hugo R., 4,129,773, Cl. 219-146.230.

Accumulatorenwerk Hoppecke: *See*—
Lahme, Norbert; and Sassmannshausen, Gunter, 4,129,687, Cl. 429-86.000.

ACF Industries, Inc.: *See*—
Shocklee, James L.; and Tayloe, Edward H., 4,129,048, Cl. 74-612.000.

Adams, Harold E.; Boutsicaris, Stephen P.; and Halasa, Adel F., to Firestone Tire & Rubber Company, The. Process for the hydrohalogenation of buta-diene-containing polymers. 4,129,699, Cl. 526-42.000.

Adcock, Thomas P. Solar heating and cooling system. 4,129,177, Cl. 165-48.00S.

Addressograph-Multigraph Corporation: *See*—
Masiello, Felix R., 4,129,266, Cl. 242-68.400.

Adorney, Charles S. Safety razor with serpentine handle. 4,128,937, Cl. 30-47.000.

ADS Systems, Inc.: *See*—
Dolan, James P., 4,129,030, Cl. 73-23.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Deflandre, Jean; Matarasso, Pierre; and Traisnel, Jean-Pierre, 4,129,360, Cl. 350-289.000.
Warolin, Christian J.; Chabrier de Lassauniere, Pierre; and Thuong, Nguyen T., 4,129,660, Cl. 424-203.000.

Agency of Industrial Science & Technology: *See*—
Shikata, Nobuo; and Ito, Sukemitsu, 4,129,485, Cl. 204-144.500.

AGFA-Gevaert Aktiengesellschaft: *See*—
Lohmann, Joachim W.; Lapp, Otto; and Kuhn, Gerhard, 4,129,446, Cl. 96-74.000.

Ahlgren, Nils H. Methods for guiding slip-forms in slip-form concreting. 4,129,631, Cl. 264-33.000.

Aida Engineering, Ltd.: *See*—
Oishi, Yoshihiro, 4,129,071, Cl. 100-53.000.

Aizawa, Hiroshi: *See*—
Yamamichi, Masayoshi; Iura, Yukio; Tezuka, Nobuo; Watanabe, Satoshi; Uchidoi, Masanori; and Aizawa, Hiroshi, 4,129,877, Cl. 354-271.000.

Akashi, Teruo; Watanabe, Kazuaki; and Terakura, Yukio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Gear means of an automatic transmission for automobiles. 4,129,050, Cl. 74-750.00R.

Aketa, Kan: *See*—
Taguchi, Kazumasa; Nishida, Tsutomu; Kitajima, Masaharu; Aketa, Kan; Fujita, Isao; Onoda, Mamoru; Imanishi, Nobuyuki; and Watanabe, Ryo, 4,129,437, Cl. 75-5.000.

Aktiebolaget Electrolux: *See*—
Hammar, John R., 4,129,408, Cl. 431-251.000.

Aktiebolaget Fellingsbro Verkstader: *See*—
Brehmer, Roland; and Sorberg, Bengt, 4,129,149, Cl. 137-599.100.

Aktiebolgatet Svenska Flaktfabriken: *See*—
Andersson, Rune S.; and Berglund, Svante O., 4,129,428, Cl. 55-379.000.

Akzona Incorporated: *See*—
Praetorius, Heinz; Seibert, Karl; and Holtvoigt, Werner, 4,129,717, Cl. 528-421.000.
Rauwendaal, Christiaan J., 4,129,386, Cl. 366-88.000.
Schwartzkopff, Udo; and Fischer, Horst, 4,129,097, Cl. 119-28.000.
Zengel, Hans; and Bergfeld, Manfred, 4,129,740, Cl. 560-48.000.

Alberto-Culver Company: *See*—
Dasher, George F.; and Fiebig, August E., Jr., 4,129,505, Cl. 252-8.800.

Alles, Harold G., to Bell Telephone Laboratories, Incorporated. PCM data throttle. 4,129,751, Cl. 179-15.0BW.

Allgeier, Michael, to Vivitar Corporation. Light mixing apparatus and photographic enlarger embodying same. 4,129,372, Cl. 355-1.000.

Alliages Frittes S.A.: *See*—
Pinettes, Jacques; and Chaix, Jean, 4,129,771, Cl. 219-104.000.

Allied Chemical Corporation: *See*—
Baker, Josefina T.; Pisanchyn, John; and Sifniades, Stylianos, 4,129,594, Cl. 260-544.00D.
Fitch, Robert H.; Kurtz, Bruce E.; and Smura, Bronislaw B., 4,129,495, Cl. 204-279.000.
Garner, Eugene F.; and Hamilton, Brian K., 4,128,996, Cl. 60-205.000.
Marshall, Robert M.; Pak, Sung K.; and Dardoufas, Kimon C., 4,129,507, Cl. 252-8.900.

Allis-Chalmers Corporation: *See*—
Bliemeister, Robert M., 4,129,036, Cl. 73-140.000.

Alps Electric Co., Ltd.: *See*—
Miyata, Hiroyasu; and Iwasaki, Sadayoshi, 4,129,766, Cl. 200-308.000.
Murata, Taneo, 4,129,763, Cl. 200-159.00A.
Ohkita, Masao; and Sato, Hidetoshi, 4,129,764, Cl. 200-159.00R.

Alps Motorola: *See*—
Suzuki, Shoji, 4,129,890, Cl. 360-94.000.

Althauser, William E.; and Barnes, Richard A., to International Business Machines Corporation. Method and apparatus for producing compensated signals for individual light sensors arranged in a predetermined relation. 4,129,853, Cl. 340-146.3AG.

Aluminum Company of America: *See*—
Deveney, Charles H., 4,129,024, Cl. 72-329.000.

Amagami, Keizo; Nakamura, Masatatsu; Kominami, Hideyuki; Funakoshi, Kouji; Kiuchi, Mitsuyuki; and Mizukawa, Takumi, to Matsushita Electric Industrial Company, Limited. Induction heating apparatus having timing means responsive to temporary removal of cooking implement. 4,129,767, Cl. 219-10.49R.

Amanita Sound, Inc.: *See*—
Griffin, Timothy L., Jr., 4,129,752, Cl. 179-146.00E.

American Chemical Consulting Corp.: *See*—
Stockel, Richard F., 4,129,094, Cl. 119-1.000.

American Cyanamid Company: *See*—
Bernstein, Seymour; Lenhard, Robert H.; and Conrow, Ransom B., 4,129,591, Cl. 260-506.000.
Conrow, Ransom B.; and Bernstein, Seymour, 4,129,590, Cl. 260-506.000.
Franz, Curtis A., 4,129,452, Cl. 106-243.000.
Giglia, Robert D., 4,129,861, Cl. 340-324.00R.
Kaplan, Earl; and Pinto, Frank G., 4,129,538, Cl. 260-23.70M.
Mino, Guido; and Behrens, Rudolf A., 4,129,708, Cl. 526-218.000.
Panzer, Hans P.; O'Connor, Michael N. D.; and Baccei, Louis J., 4,129,532, Cl. 526-75.000.
Westman, Morton A., 4,129,415, Cl. 8-102.000.

American Home Products Corporation: *See*—
Sellstedt, John H.; and Klaubert, Dieter H., 4,129,735, Cl. 544-132.000.
Stein, Reinhardt P.; and Delecki, Daniel J., 4,129,561, Cl. 260-239.0BB.

AMF Incorporated: *See*—
Cupp, William A., 4,129,207, Cl. 198-445.000.

Ampex Corporation: *See*—
Harshberger, Robert P., Jr., 4,129,810, Cl. 318-317.000.

Amrine, Bruce A., to Sarns, Inc. Venous return catheter and a method of using the same. 4,129,129, Cl. 128-214.00R.

AMSTED Industries Incorporated: *See*—
Polanin, Walter R., 4,129,219, Cl. 213-100.00R.

Anderson, Andrew W.; and Mateyka, Milan, to Scandia Packaging Machinery Company. Method and assembly for feeding articles. 4,129,205, Cl. 198-358.000.

Anderson, Eldon E., to Gerling Moore, Inc. Method and apparatus for microwave heating of flowable material. 4,129,768, Cl. 219-10.55A.

Anderson, George J.; Desmond, Timothy F.; and Santer, J. Owen, to Monsanto Company. Coating compositions comprising alkoxymethylaminotriazines, polyols and polyhydroxy oligomers. 4,129,681, Cl. 428-524.000.

Anderson, Paul R. Bubble discharging device. 4,128,962, Cl. 46-7.000.

Andersson, Bo Allan; and Callahan, Richard P. Stabilizing check valve. 4,129,144, Cl. 137-541.000.

Andersson, Rune S.; and Berglund, Svante O., to Aktiebolgatet Svenska Flaktfabriken. Compact filter mounted in a cassette frame. 4,129,428, Cl. 55-379.000.

Ando, Hisashi: *See*—
Soeno, Ko; Iizuka, Tomio; Doi, Toshio; Ando, Hisashi; Oyama, Testuo; Sakamoto, Hiroshi; and Misumi, Akira, 4,129,801, Cl. 313-346.00R.

Anell, Wolfgang, to August Bilstein, Firma. Lifting jack for vehicles. 4,129,286, Cl. 254-103.000.

Angello, Joseph P., to United States of America, Army. Thermoelectric generator overload protective device using hysterisis control. 4,129,893, Cl. 361-21.000.

Ango, Alvino J. Bi-directional, multiple range torque measuring device. 4,129,035, Cl. 73-136.00B.

Anthony, James R.: *See—*
Happel, Hermann E.; and Anthony, James R., 4,128,924, Cl. 24-230.0AL.

Anthony, Patrick R., to Electrohome Limited. Systems for supplying unmodulated baseband signals to television receivers. 4,129,884, Cl. 358-188.000.

Anton Steinecker Maschinenfabrik GmbH: *See—*
Wolfseder, Alfons; Urban, Hans; and Redl, Simon, 4,129,504, Cl. 210-247.000.

Applied Research Commodities Ind., Inc.: *See—*
Spector, Donald, 4,128,966, Cl. 47-69.000.

Araki, Kunio: *See—*
Makuuchi, Keizo; Araki, Kunio; Takagi, Tohru; Nakayama, Hiroyuki; and Kozu, Haruo, 4,129,487, Cl. 204-159.140.

ARCO Polymers, Inc.: *See—*
Fava, Ronald A., 4,129,614, Cl. 260-876.00B.
Fava, Ronald A., 4,129,615, Cl. 260-876.00B.
Fava, Ronald A., 4,129,619, Cl. 260-901.000.
Wright, Harold A., 4,129,707, Cl. 526-204.000.

Arendt, Armin, to Robert Bosch GmbH. Voltage regulator circuit for motor vehicle generator with feedback to oppose regulator transients. 4,129,819, Cl. 322-28.000.

Argentine, Jeffery C.; and Minton, Darrell B., to National Controls, Inc. Postal meter actuator. 4,129,815, Cl. 318-601.000.

Argus Chemical Corporation: *See—*
Lewis, Roger N.; Pastorino, Ronald L.; and Wilts, James F., 4,129,613, Cl. 260-861.000.

Armond, John W., to BOC Limited. Gas separation. 4,129,424, Cl. 55-25.000.

Armstrong Cork Company: *See—*
Bennett, Roxanne L.; and Tshudy, James A., 4,129,416, Cl. 8-115.000.
Kennedy, Wayne C., 4,129,637, Cl. 264-112.000.

Arthur D. Little, Inc.: *See—*
McCullough, John E., 4,129,405, Cl. 418-55.000.

Asahi-Dow Limited: *See—*
Yasuike, Akio; Kataoka, Hiroshi; and Toyouchi, Kaoru, 4,129,635, Cl. 264-45.500.

Asano, Koichi: *See—*
Machi, Sueo; Matsui, Yasushi; Sugishita, Akio; Sugo, Takanobu; Taniguchi, Hiroaki; Asano, Koichi; and Fujiwara, Hiroshi, 4,129,617, Cl. 260-879.000.

Ashland Oil, Inc.: *See—*
Michelson, Anatol, 4,129,168, Cl. 164-159.000.
Moore, William P., Jr., 4,129,533, Cl. 521-117.000.

Astech: *See—*
Fage, Etienne, 4,129,269, Cl. 244-110.00B.

Atari, Inc.: *See—*
Stubben, David R., 4,129,883, Cl. 358-104.000.

Atlantic Richfield Company: *See—*
Stover, Dennis E., 4,129,334, Cl. 299-4.000.

Atlas Copco Aktiebolag: *See—*
Lavon, Erik V.; Lemcke, Bo; and Karlfors, Levi J., 4,129,335, Cl. 299-17.000.

Atobe, Daisuke: *See—*
Awaji, Toshio; and Atobe, Daisuke, 4,129,609, Cl. 260-837.00R.

Aubert, Jacques; Carles, Maurice; and Neige, Roger, to Commissariat A l'Energie Atomique. Uranium isotopic enrichment. 4,129,481, Cl. 204-1.500.

August Bilstein, Firma: *See—*
Anell, Wolfgang, 4,129,286, Cl. 254-103.000.

Auxilec: *See—*
Bregeault, Marc; Lecoeuche, Jacques; and Margrain, Pierre, 4,129,808, Cl. 318-254.000.

Aversano, Frank J.; Carver, Leon; and Seifert, Ludwik I., to Sperry Rand Corporation. Wide angle anamorphic display projection system. 4,129,365, Cl. 353-99.000.

Awaji, Toshio; and Atobe, Daisuke, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Method for improving storage stability of epoxy ester thermosetting resins with thiuram compounds. 4,129,609, Cl. 260-837.00R.

Axelrod, Robert J.; Mark, Victor; and Wilson, Phillip S., to General Electric Company. Plasticized with a minor amount of an oligomeric polymeric polycarbonate. 4,129,546, Cl. 260-31.80T.

B. F. Goodrich Company, The: *See—*
Kroenke, William J., 4,129,540, Cl. 260-28.50A.
Riew, Changkiu K., 4,129,670, Cl. 427-386.000.
Skillicorn, Douglas E., 4,129,713, Cl. 526-320.000.

Babcock & Wilcox Limited: *See—*
Campbell, John W. E., 4,129,098, Cl. 122-4.00D.

Baccei, Louis J.: *See—*
Panzer, Hans P.; O'Connor, Michael N. D.; and Baccei, Louis J., 4,129,532, Cl. 526-75.000.

Bacotti, Peter A.; and Kraft, Frederick M. Eye testing device for prescribing eyeglasses. 4,129,361, Cl. 351-22.000.

Bader, Ernest, Jr.; Deckard, John I.; and Kuiper, Dan B., to General Motors Corporation. Electromagnetic unit fuel injector. 4,129,253, Cl. 239-88.000.

Bader, Ernest, Jr.; Deckard, John I.; and Kuiper, Dan B., to General Motors Corporation. Electromagnetic unit fuel injector. 4,129,254, Cl. 239-96.000.

Bader, Ernest, Jr.; Deckard, John I.; and Kuiper, Dan B., to General Motors Corporation. Electromagnetic unit fuel injector. 4,129,255, Cl. 239-96.000.

Bader, Ernest, Jr.; Deckard, John I.; and Kuiper, Dan B., to General Motors Corporation. Electromagnetic unit fuel injector. 4,129,256, Cl. 239-96.000.

Bahr, Gunter F.: *See—*
Wied, George L.; Bahr, Gunter F.; and Puls, James H., 4,129,381, Cl. 356-36.000.

Bailey, Edward L., to Owens-Illinois, Inc. Variable strength plastic wrap on glass bottles. 4,129,225, Cl. 215-12.00R.

Baker, Josefina T.; Pisanchyn, John; and Sifniades, Stylianos, to Allied Chemical Corporation. Process for the manufacture of aromatic dicarboxylic acid chlorides. 4,129,594, Cl. 260-544.00D.

Baker, Joseph. Kite parachute launcher. 4,129,274, Cl. 244-155.00R.

Baker, Marlin J. Garbage disposal. 4,129,260, Cl. 241-46.00A.

Baker Perkins Holdings Limited: *See—*
Edwards, Albert, 4,129,165, Cl. 164-7.000.

Baker Perkins Inc.: *See—*
Todd, David B., 4,129,249, Cl. 233-7.000.

Balatan, Sergio E., to M&T Chemicals Inc. Interpolymers, method of preparing the same and emulsions thereof, and metal cans coated with the interpolymers. 4,129,712, Cl. 526-304.000.

Bales, O. Sherman: *See—*
Rustin, Rudolph B., Jr.; and Bales, O. Sherman, 4,129,246, Cl. 229-23.00R.

Ban, Itsuki; and Mochizuki, Kazunori. Magnetic recording/reproducing apparatus using cassette. 4,129,889, Cl. 360-75.000.

Bandurco, Victor T.; and Levine, Seymour, to Ortho Pharmaceutical Corporation. Substituted pyrrolo [1,2-c] quinazolines and pharmaceutical compositions and methods employing them. 4,129,653, Cl. 424-251.000.

Bandy, Clarence L., Jr., to Westvaco Corporation. Reeled web unwind stand. 4,129,265, Cl. 242-58.200.

Banke, Kerry O., to Samuel G. Dawson. Method and apparatus for providing differential temperature thermostat control for solar hot water systems. 4,129,118, Cl. 126-271.000.

Bar, Ulrich: *See—*
Tschunt, Edgar; Platz, Winfried; Bar, Ulrich; and Heinz, Lothar, 4,129,784, Cl. 250-505.000.

Barnes, Richard A.: *See—*
Althauser, William E.; and Barnes, Richard A., 4,129,853, Cl. 340-146.3AG.

Barnett, Gabriel; Gershaw, Nathan; and Mausner, Jack J., to Helena Rubinstein, Inc. Sunscreen compositions. 4,129,645, Cl. 424-60.000.

Barritt, Murrell R. Easily attachable and detachable gauge for re-locating tested bevel gears on a gear-cutting machine. 4,128,945, Cl. 33-181.00R.

Barth, Wayne E., to Pfizer Inc. 4(Tetrazol-5-yl)-$\Delta^3$-cephem compounds. 4,129,732, Cl. 544-23.000.

Baruzzi, Giovanni: *See—*
Credali, Lino; Baruzzi, Giovanni; and Guidotti, Vincenzo, 4,129,559, Cl. 528-337.000.

BASF Aktiengesellschaft: *See—*
Keppler, Hans G.; Stahnecker, Erhard; and Moeller, Rolf, 4,129,706, Cl. 526-201.000.
Kiehs, Karl; and Huber, Rolf, 4,129,601, Cl. 568-593.000.
Patsch, Manfred; and Hettche, Albert, 4,129,563, Cl. 260-239.900.

BASF Wyandotte Corporation: *See—*
Cenker, Moses; and Kan, Peter T., 4,129,693, Cl. 521-106.000.
Muzzio, John A., 4,129,718, Cl. 536-4.000.

Basi, Jagtar S., to International Business Machines Corporation. Post-polishing cleaning of semiconductor surfaces. 4,129,457, Cl. 134-2.000.

Batelle Memorial Institute: *See—*
Walker, Ray A.; Reich, Fred R.; and Russell, James T., 4,129,384, Cl. 356-381.000.

Baudin, Bernard, to Etablissements P. Ferbeck & Vincent. Rotary injector for liquid residue incinerating furnace. 4,129,081, Cl. 10-238.000.

Bauer, Josef; Krause, Herbert; and Meltsch, Hans-Juergen, to Siemens Aktiengesellschaft. Tool for opening cable fittings. 4,128,931, Cl. 29-239.000.

Bayer Aktiengesellschaft: *See—*
Boden, Heinrich; and Knipp, Ulrich, 4,129,636, Cl. 264-51.000.
Dhein, Rolf; and Fleiter, Lothar, 4,129,537, Cl. 260-23.0EP.
Markusch, Peter; Dieterich, Dieter; and Dietrich, Manfred, 4,129,696, Cl. 521-154.000.
Schapel, Dietmar; and von Gizycki, Ulrich, 4,129,697, Cl. 521-176.000.
Serini, Volker; Friedhofen, Gerhard; Frietag, Dieter; and Heuser, Jurgen, 4,129,612, Cl. 260-860.000.

Baylis, Anthony B.: *See—*
Slinkard, William E.; and Baylis, Anthony B., 4,129,592, Cl. 562-549.000.

Bazile, Yves: *See—*
Pigerol, Charles; de Cointet de Fillain, Paul; and Bazile, Yves, 4,129,572, Cl. 260-326.12R.

Beard, Colin C.: *See—*
Roszkowski, Adolph P.; Beard, Colin C.; Dvorak, Charles; and Weinhardt, Klaus, 4,129,661, Cl. 424-273.00R.

Beaver, Millard B.; Johnson, Leonard L.; Hart, Harry L.; and Mahoney, Tennis, to Lincoln Logotype Co., Inc. Multi-line imprinting wheel apparatus. 4,129,074, Cl. 101-35.000.

Beck, Orville F.: *See—*
Theurer, John; Guenzel, William C.; and Beck, Orville F., 4,129,395, Cl. 403-317.000.

Beck, Wilfried: *See—*
Ruegg, Andre; and Beck, Wilfried, 4,129,280, Cl. 248-183.000.

Bedall, Hans; and Rentzsch, Max, to DIEHL. Fragmentation casing for

shells, warheads and the like and method of making same. 4,129,061, Cl. 86-20.00B.
Beeck, Carlos L.: *See—*
Telewski, Fred J.; Beeck, Carlos L.; and Snow, Philip B., 4,129,897, Cl. 361-399.000.
Begrich, Rainer, to Ciba-Geigy Corporation. Triazinyl-antraquinone dyestuffs. 4,129,736, Cl. 544-189.000.
Behrens, Rudolf A.: *See—*
Mino, Guido; and Behrens, Rudolf A., 4,129,708, Cl. 526-218.000.
Beilfuss, Wolfgang: *See—*
Eggensperger, Heinz; and Beilfuss, Wolfgang, 4,129,517, Cl. 252-186.000.
Bell, Edward L.: *See—*
Fick, Edwin O., Jr.; and Bell, Edward L., 4,128,916, Cl. 17-52.000.
Bell, Stephen L., to Imperial Chemical Industries Limited. Manufacture of halogenated compounds. 4,129,603, Cl. 260-653.000.
Bell Telephone Laboratories, Incorporated: *See—*
Alles, Harold G., 4,129,751, Cl. 179-15.0BW.
Duttweiler, Donald L., 4,129,753, Cl. 179-170.200.
Jaeger, Raymond E.; and Presby, Herman M., 4,129,433, Cl. 65-2.000.
Knab, Emil D., 4,129,468, Cl. 156-148.000.
Limb, John O., 4,129,882, Cl. 358-13.000.
von Roesgen, Charles A., 4,129,349, Cl. 339-17.00C.
Bell, Theodore F. Bicycle. 4,129,317, Cl. 280-281.00R.
Belli, Johann B.: *See—*
van der Pool, Kees; Rosinski, Louis S., Jr.; and Belli, Johann B., 4,129,823, Cl. 324-20.00R.
Bellus, Daniel; Fory, Werner; and Tobler, Hans, to Ciba-Geigy Corporation. Compositions for and method of influencing plant growth and novel 1-phenyl-2-oxo-pyrrolidine-4-carboxylic acid derivatives. 4,129,573, Cl. 260-326.450.
Bendibercia, S.A.: *See—*
Trenc, Ramon B., 4,129,340, Cl. 303-6.00R.
Bendix Corporation, The: *See—*
Johannesen, Donald D., 4,129,200, Cl. 188-71.100.
Pauwels, Edward M., 4,129,341, Cl. 303-6.00R.
Winters, Harry K.; and Chambers, Warren D., 4,129,202, Cl. 188-181.00T.
Benke, Frank W., to Electric Power Research Institute, Inc. Vaporization cooled electrical apparatus. 4,129,845, Cl. 336-57.000.
Bennelli, Dore D. Electronic device for controlling the winding off of material wound up on a core by tensiometric control. 4,129,154, Cl. 139-110.000.
Bennett, Roxanne L.; and Tshudy, James A., to Armstrong Cork Company. Process for shrinking nylon fabrics. 4,129,416, Cl. 8-115.000.
Benson, James L. Ski device. 4,129,313, Cl. 280-12.00H.
Bentley Engineering Group, Ltd.: *See—*
Bonetti, Danillo, 4,129,153, Cl. 139-28.000.
Bentley, William F.: *See—*
Luedtke, Arthur; and Bentley, William F., 4,129,874, Cl. 343-854.000.
Bergfeld, Manfred: *See—*
Zengel, Hans; and Bergfeld, Manfred, 4,129,740, Cl. 560-48.000.
Berglund, Svante O.: *See—*
Andersson, Rune S.; and Berglund, Svante O., 4,129,428, Cl. 55-379.000.
Bergmann, Klaus W.; Steffen, Gunther B. H.; and Monkemoller, Herbert, to Bergmann & Steffen OhG. Machine for machining tubes having helical weld seams. 4,129,062, Cl. 90-11.00R.
Bergmann & Steffen OhG: *See—*
Bergmann, Klaus W.; Steffen, Gunther B. H.; and Monkemoller, Herbert, 4,129,062, Cl. 90-11.00R.
Bergstrom, Theodore R., to Thermograte, Inc. Combination glass door and heat-exchanging grate for fireplaces. 4,129,113, Cl. 126-121.000.
Berman, Nelson. Roadway vehicle. 4,129,203, Cl. 191-48.000.
Bernstein, Seymour; Lenhard, Robert H.; and Conrow, Ransom B., to American Cyanamid Company. Ureidophenylenebis(substituted imino)multianionic substituted dinaphthalene sulfonic acids and salts. 4,129,591, Cl. 260-506.000.
Bernstein, Seymour: *See—*
Conrow, Ransom B.; and Bernstein, Seymour, 4,129,590, Cl. 260-506.000.
Berry, Samuel M.: *See—*
Pierce, William C.; Berry, Samuel M.; and Johnson, Arthur D., 4,129,026, Cl. 72-367.000.
Berthier, Pierre, to Manufacture de Vilebrequins de Lorette S.A. Hole-cutting tool with a free central portion and ejector apparatus for the core of metal formed by the tool. 4,129,401, Cl. 408-59.000.
Berthold, Richard, to Sandoz Ltd. 4-Styryl-hexahydro-4-indolinols. 4,129,658, Cl. 424-274.000.
Bertin & Cie: *See—*
Rouquie, Georges, 4,129,668, Cl. 427-57.000.
Bertschy, Pierre Y.: *See—*
Kruseman, Jan; Bertschy, Pierre Y.; and Hidalgo, Jaime, 4,129,664, Cl. 426-7.000.
Betitschke, Bruce A.: *See—*
Bulanda, John J.; Guzay, Casimir M.; and Betitschke, Bruce A., 4,128,919, Cl. 24-20.01TT.
Betulius, Gilbert E., to Chem-Farm Inc. Earth working and fluid distribution apparatus. 4,129,082, Cl. 111-7.000.
Betzing, Hans; and Lekim, Dac, to A. Nattermann & Cie. GmbH. Novel phospholipid derivatives of prostaglandins and process of their preparation. 4,129,650, Cl. 424-211.000.
Beynon, John O., to Ceiling & Drywall Products Limited. Controlled expansion suspended ceiling grid beam. 4,128,978, Cl. 52-232.000.
Bickel, Wolf, to Krautkramer-Branson, Incorporated. Method and apparatus for receiving ultrasonic waves by optical means. 4,129,041, Cl. 73-657.000.
Biddick, Royce E., to Gould Inc. Process and apparatus for manufacture of an electrode. 4,129,633, Cl. 264-40.300.
Bieberich, Paul, to Fort Wayne Wire Die, Inc. Wire drawing die and method of making the same. 4,129,052, Cl. 76-107.00A.
Biedacha, Roman; Kurdziel, Wladyslaw; Kaczor, Janusz; Smeder, Adam; Kolaczkowski, Jacek; Olszowski, Tadeusz; Nawrocki, Adam; and Rzeszut, Janina, to Przedsicbiorstwo Projektowania I Realizacji Inwestycji przemyslu Maszynowego "Bipromasz", Instytut Odlewnictwa. Apparatus for making shells from thermosetting liquid compounds. 4,129,169, Cl. 164-166.000.
Bigarella, Federico. Vial-syringe. 4,129,130, Cl. 128-218.00P.
Bigelow, John E.; and Peroutky, Donald C., to General Electric Company. Stacked blade matrix printer heads. 4,129,390, Cl. 400-121.000.
Billett, Ronald J.; and Harper, Bruce M., to FMC Corporation. Tablet dispenser. 4,129,230, Cl. 221-268.000.
Bilow, Norman; Landis, Abraham L.; and Miller, Leroy J., to Hughes Aircraft Company. Nitrile substituted polyimide oligomers. 4,129,570, Cl. 528-128.000.
Bird, Thomas L.: *See—*
Jones, Ivor W.; Robinson, Graham; and Bird, Thomas L., 4,129,690, Cl. 429-104.000.
Bisbing, Robert H., to Southco, Inc. Snap-in receptacle assembly for fastener. 4,128,923, Cl. 24-221.00R.
Bittler, Dieter: *See—*
Wiechert, Rudolf; Bittler, Dieter; Kerb, Ulrich; Casals-Stenzel, Jorge; and Losert, Wolfgang, 4,129,564, Cl. 260-239.570.
Black Clawson Company, The: *See—*
Vokes, Robert F., 4,129,259, Cl. 241-20.000.
Bliemeister, Robert M., to Allis-Chalmers Corporation. Alignment indicator for roller-type support. 4,129,036, Cl. 73-140.000.
BOC Limited: *See—*
Armond, John W., 4,129,424, Cl. 55-25.000.
Bochner, Barry R. Device, composition and method for identifying microorganisms. 4,129,483, Cl. 195-100.000.
Boden, Heinrich; and Knipp, Ulrich, to Bayer Aktiengesellschaft. Process for providing mixed foamable reactants to a mold. 4,129,636, Cl. 264-51.000.
Boe, Norman W., to Monsanto Company. Melt spun side-by-side biconstituent conductive fiber. 4,129,677, Cl. 428-372.000.
Boeing Company, The: *See—*
Gerstine, Milton I.; Goldberg, Joshua I.; Futatsugi, Setsuo; Ueda, Kazuo; Seo, Ryozo; Iwasaki, Koji; and Uemura, Makoto, 4,129,275, Cl. 244-181.000.
Robinson, Ronald H.; and Weiland, Richard H., 4,129,270, Cl. 244-135.00A.
Boerman, Lee D.: *See—*
Shneider, David; and Boerman, Lee D., 4,129,126, Cl. 128-80.00A.
Boggs, Roger L.: *See—*
Vanlandingham, Harold W.; Boggs, Roger L.; Bullock, David A.; and Maytum, James N., 4,128,932, Cl. 29-401.00R.
Boisserand, Marc. Fluid distributor and fluid distributor cell. 4,129,150, Cl. 137-872.000.
Bomberger, Howard B., Jr., to RMI Company. Method of adding trace elements to base metals. 4,129,438, Cl. 75-10.00C.
Bond, Ronald L.; Daughdrill, E. Chris; Brice, Henry T.; and Horton, Phineas E., III, to Swacars, Inc. Towing vehicle with elevated ramp. 4,129,314, Cl. 280-425.00R.
Bonetti, Danillo, to Bentley Engineering Group, Ltd. Loom for weaving. 4,129,153, Cl. 139-28.000.
Bonin, Yves, to Rhone-Poulenc Industries. Process for preparing foams from polyisocyanates and polyepoxides. 4,129,695, Cl. 521-108.000.
Bonvallet, Duane J. Acceleration compensated device for ski bindings. 4,129,245, Cl. 280-628.000.
Booth, Jeffrey: *See—*
Roberts, Philip D.; Randall, Geoffrey L. P.; Simon, David G.; and Booth, Jeffrey, 4,129,702, Cl. 526-71.000.
Booth, Stuart E.: *See—*
Grange, Arthur; and Booth, Stuart E., 4,129,387, Cl. 366-119.000.
Borr, Mitchell: *See—*
Matheson, Alister F.; Tosh, Douglas J.; and Borr, Mitchell, 4,129,542, Cl. 260-28.5AS.
Bourguignon, Ludwig. Magnetic closure device. 4,128,920, Cl. 24-201.00B.
Boutsicaris, Stephen P.: *See—*
Adams, Harold E.; Boutsicaris, Stephen P.; and Halasa, Adel F., 4,129,699, Cl. 526-42.000.
Bowerman, William J.; James, Stanley L.; and Vixie, Dennis E., to BRS, Inc. Multilayered sole athletic shoe with improved foam midsole. 4,128,950, Cl. 36-30.00R.
Boyer, James A., to General Motors Corporation. Magnetic pickup type ignition distributor. 4,129,107, Cl. 123-146.50A.
BP Chemicals International Limited: *See—*
Park, Anthony J.; and Sturt, Alan C., 4,129,698, Cl. 526-3.000.
Bradley, Steven A.: *See—*
Janowski, Kenneth R.; Shum, Ming S.; and Bradley, Steven A., 4,129,181, Cl. 165-133.000.
Bregeault, Marc; Lecoeuche, Jacques; and Margrain, Pierre, to Auxilec. Electronic control arrangement which can be used in particular for driving a brushless and slip-ringless motor and an installetion incorporating such an arrangement. 4,129,808, Cl. 318-254.000.
Brehmer, Roland; and Sorberg, Bengt, to Aktiebolaget Fellingsbro Verkstader; and Erik Sorberg Armaturfabrik Aktiebolag. Control valve means. 4,129,149, Cl. 137-599.100.
Brentini, Attilio. Closure device. 4,129,021, Cl. 70-456.00R.

Bressler, Peter W., to Edmund Scientific Company. Tripod. 4,129,278, Cl. 248-165.000.
Brice, Henry T.: *See—*
Bond, Ronald L.; Daughdrill, E. Chris; Brice, Henry T.; and Horton, Phineas E., III, 4,129,314, Cl. 280-425.00R.
Bridgestone Cycle Co., Ltd.: *See—*
Tamura, Yoshitaka, 4,129,201, Cl. 188-76.000.
Brinegar, Paul E. Electrical conductor and short circuit locator. 4,129,825, Cl. 324-52.000.
British Gas Corporation: *See—*
Wood, Andrew, 4,129,422, Cl. 48-62.00R.
British Petroleum Company Limited, The: *See—*
Cairns, Roger J. R.; and Howard nee Murtagh, Joan M., 4,129,499, Cl. 210-23.00R.
Harvey, Lawrence, 4,129,117, Cl. 126-271.000.
Kisselow, Alexander W.; and Wulk, Peter K., 4,129,512, Cl. 252-51.50A.
Brock, Elwood M., to Hunterdon Transformer Company. Improved variable reactance transformer. 4,129,820, Cl. 323-56.000.
Brolund, Theodore F.; and Scott, William B., to W. A. Whitney Corp. Method for coping I-beams. 4,129,460, Cl. 148-9.00R.
Bromley, James E.; Mowe, Wayne T.; and Stutz, Frank, to Monsanto Company. Deep-dyeing polyester spinning process. 4,128,989, Cl. 57-247.000.
Broussely, Michel, to Saft-Societe des Accumulateurs Fixes et de Traction. Organic solvent electrolytes for high specific energy primary cells. 4,129,691, Cl. 429-197.000.
Brown, Boveri & Company Limited: *See—*
Korischum, Fritz, 4,129,745, Cl. 174-209.000.
Brown, David A.; and Carmean, E. A., Jr. Doll display receptacle. 4,129,210, Cl. 206-45.310.
Brown, John M.: *See—*
Kooi, John H.; Schure, Ralph M.; and Brown, John M., 4,129,607, Cl. 260-835.000.
Brown, William L., to SI Handling Systems, Inc. Article dispensing apparatus. 4,129,229, Cl. 221-129.000.
BRS, Inc.: *See—*
Bowerman, William J.; James, Stanley L.; and Vixie, Dennis E., 4,128,950, Cl. 36-30.00R.
Bruchet, Michel, to Societe Anonyme dite: UNELEC. Circuit-breaker operating mechanism. 4,129,762, Cl. 200-153.00G.
Bruno Albrecht KG: *See—*
Dietz, Bernhard, 4,129,364, Cl. 353-99.000.
Brusselle, Victor. Machine for the shaping of meat dishes. 4,128,915, Cl. 17-32.000.
Bryant, Duane K.: *See—*
Colburn, Samuel E.; Bryant, Duane K.; Platz, Gerald M.; and Vetter, Clarence J., Jr., 4,129,714, Cl. 526-331.000.
Buccellato, Joseph L.: *See—*
Hern, John F.; and Buccellato, Joseph L., 4,129,325, Cl. 292-127.000.
Buchan, John D.: *See—*
France, James R.; Buchan, John D.; Tyrer, Richard G.; De Ceuleneer, Adolf; and Van Steenkiste, Robert, 4,129,091, Cl. 118-50.000.
Bucking, Hans-Walter: *See—*
Wallhausser, Karl H.; Cuntze, Ulrich; May, Adolf; and Bucking, Hans-Walter, 4,129,506, Cl. 252-8.800.
Buder, Wolfgang; Pletka, Hans-Dieter; Michel, Rudolf; Schwarz, Rudolf; and Dusing, Gerhard, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of sulfur containing organosilicon compounds. 4,129,585, Cl. 260-448.80R.
Bula, John; and Martin, Larry C., to International Business Machines Corporation. High speed true/complement driver. 4,129,793, Cl. 307-270.000.
Bulanda, John J.; Guzay, Casimir M.; and Betitschke, Bruce A., to Panduit Corp. Metal tie. 4,128,919, Cl. 24-20.0TT.
Bullock, David A.: *See—*
Vanlandingham, Harold W.; Boggs, Roger L.; Bullock, David A.; and Maytum, James N., 4,128,932, Cl. 29-401.00R.
Bundy, Gordon L., to Upjohn Company, The. 9-Deoxy-9-methylene-PGF-3,4-didehydropiperidylamides. 4,129,724, Cl. 542-426.00⁰).
Bundy, Gordon L., to Upjohn Company, The. 9-Deoxy-9-methylene-$PGF_1$-pyrrolinylamides. 4,129,725, Cl. 542-426.000.
Bundy, Gordon L., to Upjohn Company, The. 9-Deoxy-9-methylene-$PGF_1$-piperizinylamides. 4,129,726, Cl. 542-426.000.
Bundy, Gordon L., to Upjohn Company, The. 9-Deoxy-9-methylene-$PGF_1$-pyrrolidylamides. 4,129,727, Cl. 542-426.000.
Burkholder, Harvey Z., to Favorite Manufacturing, Inc. Truss clip. 4,129,279, Cl. 248-165.000.
Burlington Industries, Inc.: *See—*
Greer, James E., 4,129,017, Cl. 68-15.000.
Burns, Timothy L.: *See—*
Whittington, Billy J.; Burns, Timothy L.; and Welsh, Alan B., 4,129,055, Cl. 84-1.010.
Burroughs Corporation: *See—*
Kasu, Abdul L.; and Tustaniwskyj, Jerry I., 4,129,892, Cl. 360-130.000.
Ragle, Herbert U.; and DeMoss, Dean, 4,129,891, Cl. 360-98.000.
Busch, Theodore N., to Caswell Equipment Company. Apparatus for hit scoring targets. 4,129,299, Cl. 273-102.20S.
Butterworth, George A. M.; Elias, Robert T.; and Miller, Wayne D., to Johnson & Johnson. Fibrous material and method of making the same. 4,129,132, Cl. 128-287.000.
Cabot Corporation: *See—*
Dreyer, Dennis G.; Foley, Edward M.; and Rogers, Herbert E., Jr., 4,129,444, Cl. 75-251.000.
Matthews, Steven J.; Klein, H. Joseph; and Hodge, Frank G., 4,129,464, Cl. 148-162.000.
Caffarel, Jean-Claude; Papillon, Bernard; and Neel, Jean, to Rhone-Poulenc Industries. Surface-active composition based on non-ionic surfactants. 4,129,514, Cl. 252-89.00R.
Cahill, Charles A. Bicycle carry aid. 4,129,318, Cl. 280-289.00A.
Cairns, Roger J. R.; and Howard nee Murtagh, Joan M., to British Petroleum Company Limited, The. Oil separation material. 4,129,499, Cl. 210-23.00R.
Callahan, Richard P.: *See—*
Andersson, Bo Allan; and Callahan, Richard P., 4,129,144, Cl. 137-541.000.
Calspan Corporation: *See—*
Daiber, John W.; and Raymonda, John W., 4,129,835, Cl. 331-94.50G.
Schneider, Clayton J., Jr.; and Ruda, Ernest V., 4,129,078, Cl. 102-89.0CD.
Camin Research Corp.: *See—*
Lester, Robert W.; and Hotto, Robert, 4,129,125, Cl. 128-2.05R.
Campbell, John W. E., to Babcock & Wilcox Limited. Fluidized beds. 4,129,098, Cl. 122-4.00D.
Campbell, Kenneth S.: *See—*
Clement, Carl J.; Stengel, Fred H.; and Campbell, Kenneth S., 4,129,211, Cl. 206-213.100.
Campbell, Talmage D. Portable spray painting station. 4,129,217, Cl. 211-95.000.
Canon Kabushiki Kaisha: *See—*
Fujii, Motoharu; Muramatsu, Takao; Koumura, Noboru; Sugiura, Susumu; Takekawa, Nobuhiro; and Tsukada, Syusei, 4,129,072, Cl. 101-1.000.
Komine, Yoshio, 4,129,363, Cl. 352-29.000.
Miyamoto, Koichi; Tohyama, Yoshikuni; Sagara, Seiji; Kimura, Yoshimasa; and Ishida, Masato, 4,129,377, Cl. 355-14.000.
Momiyama, Kikuo, 4,129,359, Cl. 350-183.000.
Yamamichi, Masayoshi; Iura, Yukio; Tezuka, Nobuo; Watanabe, Satoshi; Uchidoi, Masanori; and Aizawa, Hiroshi, 4,129,877, Cl. 354-271.000.
Capecchi, Floriano, to CIMA Costruzioni Industriali Metalmeccaniche e Affini S.A.S. di Capecchi Floriano & C. Mold for the vulcanization or retreading of vehicle tires. 4,129,406, Cl. 425-46.000.
Carding Specialists (Canada) Limited: *See—*
Varga, John M. J., 4,128,917, Cl. 19-105.000.
Carey, Lee F.; and Friona, Anthony J., to Textron Inc. Method of fabricating an expulsion tank diaphragm. 4,129,025, Cl. 72-348.000.
Carl Hurth Maschinen- und Zahnradfabrik: *See—*
Eichinger, Johann; and Hirt, Manfred, 4,129,394, Cl. 403-57.000.
Carles, Maurice: *See—*
Aubert, Jacques; Carles, Maurice; and Neige, Roger, 4,129,481, Cl. 204-1.500.
Carlin, Richard D. Automatic flushing device. 4,129,140, Cl. 137-124.000.
Carmean, E. A., Jr.: *See—*
Brown, David A.; and Carmean, E. A., Jr., 4,129,210, Cl. 206-45.310.
Carpenter, Robert J.; and Yee, Kenneth W., to United States of America, Commerce. High speed, wide dynamic range analog-to-digital conversion. 4,129,864, Cl. 340-347.0AD.
Carrow, Guy E.: *See—*
Scott, John N., Jr.; and Carrow, Guy E., 4,129,282, Cl. 249-137.000.
Carter, William C.: *See—*
Fordyce, Homer E.; and Carter, William C., 4,129,625, Cl. 261-111.000.
Carver, Leon: *See—*
Aversano, Frank J.; Carver, Leon; and Seifert, Ludwik I., 4,129,365, Cl. 353-99.000.
Casals-Stenzel, Jorge: *See—*
Wiechert, Rudolf; Bittler, Dieter; Kerb, Ulrich; Casals-Stenzel, Jorge; and Losert, Wolfgang, 4,129,564, Cl. 260-239.570.
Casutt, Toni. Folding box for containing and displaying articles such as fruits and vegetables. 4,129,248, Cl. 229-41.00B.
Caswell Equipment Company: *See—*
Busch, Theodore N., 4,129,299, Cl. 273-102.20S.
Cataldo, John B.: *See—*
Keller, Frank R.; Cataldo, John B.; Kussy, Frank W.; and DiMarco, Bernard, 4,129,843, Cl. 335-174.000.
Caterpillar Mitsubishi Ltd.: *See—*
Kishitani, Keisuke, 4,129,045, Cl. 74-255.00R.
Caterpillar Tractor Co.: *See—*
Hasselbacher, Roland E., 4,129,185, Cl. 169-62.000.
Hedgcock, Richard L., 4,129,204, Cl. 192-89.00B.
Lemcke, Howard R., Jr., 4,129,046, Cl. 74-473.00P.
Niles, Albert B.; Franzen, Larry H.; Gardner, William J.; and Grob, Russel W., 4,129,034, Cl. 73-117.300.
Vanlandingham, Harold W.; Boggs, Roger L.; Bullock, David A.; and Maytum, James N., 4,128,932, Cl. 29-401.00R.
Catlin, Francis D.: *See—*
Peterson, Anders A.; and Catlin, Francis D., 4,129,220, Cl. 214-1.400.
Cecka, Andrew M.; Dano, Pol; and Pawling, Paul G., to Fansteel, Inc. Method for preparing a composite high strength to weight structure having shell and sleeved core. 4,129,634, Cl. 264-45.300.
Ceiling & Drywall Products Limited: *See—*
Beynon, John O., 4,128,978, Cl. 52-232.000.

Celanese Corporation: *See*—
Slinkard, William E.; and Baylis, Anthony B., 4,129,592, Cl. 562-549.000.

Celmer, Walter D.; Cullen, Walter P.; Jefferson, Mark T.; Moppett, Charles E.; Routien, John B.; and Sciavolino, Frank C., to Pfizer Inc. Polycyclic ether antibiotic. 4,129,578, Cl. 260-345.70R.

Celtite, Inc.: *See*—
Rausch, Paul G., 4,129,007, Cl. 405-261.000.

Cenker, Moses; and Kan, Peter T., to BASF Wyandotte Corporation. Urethane-modified isocyanurate foams having enhanced physical properties. 4,129,693, Cl. 521-106.000.

Ceramic Cooling Tower Company: *See*—
Furr, Dale D., 4,129,627, Cl. 261-151.000.

Chabrier de Lassauniere, Pierre: *See*—
Warolin, Christian J.; Chabrier de Lassauniere, Pierre; and Thuong, Nguyen T., 4,129,660, Cl. 424-203.000.

Chaikin, Malcolm; and Nossar, Mstislav S., to Unisearch Limited. Relative humidity control. 4,129,250, Cl. 236-44.00A.

Chaix, Jean: *See*—
Pinettes, Jacques; and Chaix, Jean, 4,129,771, Cl. 219-104.000.

Chambers, Warren D.: *See*—
Winters, Harry K.; and Chambers, Warren D., 4,129,202, Cl. 188-181.00T.

Charbonneau, Robert R.; and Spatafore, Robert M., to Minnesota Mining and Manufacturing Company. Method of constructing a sloped roof. 4,128,984, Cl. 52-746.000.

Charvat, Vernon K., to Osborn Manufacturing Corporation, The. Flexible polishing wheel and method for producing same. 4,128,972, Cl. 51-298.00R.

Chavannes, Theodore E., to Dracon Industries. High efficiency DC to DC converter. 4,129,788, Cl. 307-11.000.

Chem-Farm Inc.: *See*—
Betulius, Gilbert E., 4,129,082, Cl. 111-7.000.

Chemische Werke Huels Aktiengesellschaft: *See*—
Rueter, Joern; and Grundamann, Raban, 4,129,551, Cl. 260-45.70R.

Chen, Augustin T.; Farrissey, William J., Jr.; and Nelb, Robert G., II, to Upjohn Company, The. Polyester amides suitable for injection molding. 4,129,715, Cl. 528-67.000.

Chen, Keith A., to Wisconsin Gas Company. Laminated current surge protector. 4,129,894, Cl. 361-117.000.

Cheng, Dah Y., to International Power Technology, Inc. Regenerative parallel compound dual-fluid heat engine. 4,128,994, Cl. 60-39.050.

Cheng, Richard M. H.: *See*—
Fahim, Atef E. F.; and Cheng, Richard M. H., 4,129,064, Cl. 92-129.000.

Chestnov, Valery F.; and Shibanov, Mikhail V. Arrangement for assembling vacuum tube bases. 4,128,925, Cl. 29-25.200.

Chevron Research Company: *See*—
Hutchison, Stanley O., 4,129,308, Cl. 277-188.00R.
Messner, Harold D., 4,129,821, Cl. 324-8.000.
Olson, Carl B.; Weisner, Carl S.; and Parker, Phillip H., 4,129,632, Cl. 264-40.100.
Simic, Milutin, 4,129,453, Cl. 106-287.320.
Suzuki, Shigeto, 4,129,595, Cl. 260-544.00Y.
Tamm, Paul W., 4,129,497, Cl. 208-138.000.

Chiba, Seishi: *See*—
Okutomi, Tsutomu; Yoshino, Hisashi; and Chiba, Seishi, 4,129,760, Cl. 200-144.00B.
Okutomi, Tsutomu; Yoshino, Hisashi; Chiba, Seishi; Tsutsumi, Tadahito; and Tejima, Kouichi, 4,129,761, Cl. 200-144.00B.

Chida, Yoshinori: *See*—
Yonezawa, Setsuo; Kawakami, Tsuneta; Shimada, Tatsuo; and Chida, Yoshinori, 4,129,860, Cl. 340-324.0AD.

Childress, David L.; Hayes, William V.; and Poppe, Richard L., to Dow Chemical Company, The. Method for making acrolein and catalyst therefor. 4,129,600, Cl. 260-604.00R.

Chloride Group Limited: *See*—
King, Walter J.; Snook, James C.; and Peters, Kenneth, 4,129,692, Cl. 429-234.000.

Chloride Incorporated: *See*—
Malinowski, William J., 4,129,383, Cl. 356-439.000.

Chovanec, Donald D., to Zenith Radio Corporation. Warm-up compensation system for picture tube. 4,129,885, Cl. 358-190.000.

Christenson, Roger M.; Dowbenko, Rostyslaw; and Makhlouf, Joseph M., to PPG Industries, Inc. Preparation of polymer based powder coatings by ionizing radiation. 4,129,489, Cl. 204-159.220.

Chubb, Talbot A. Refrigeration storage and cooling tank. 4,129,014, Cl. 62-333.000.

Chugoku Marine Paints, Ltd.: *See*—
Kobayashi, Kengo; Mogami, Masayuki; Tanaka, Shigeyoshi; Nakao, Manabu; and Tamura, Sadao, 4,129,610, Cl. 260-837.00R.

Ciba-Geigy Corporation: *See*—
Begrich, Rainer, 4,129,736, Cl. 544-189.000.
Bellus, Daniel; Fory, Werner; and Tobler, Hans, 4,129,573, Cl. 260-326.450.
Huebner, Charles F., 4,129,655, Cl. 424-267.000.
Zondler, Helmut; and Moser, Roland, 4,129,556, Cl. 528-97.000.

CIMA Costruzioni Industriali Metalmeccaniche e Affini S.A.S. di Capecchi Floriano & C.: *See*—
Capecchi, Floriano, 4,129,406, Cl. 425-46.000.

Civil & Civic Pty. Limited: *See*—
Abdallah, Nessib, 4,128,980, Cl. 52-251.000.

CKD Praha, oborovy podnik: *See*—
Reichel, Pavel; Kafunek, Pavel; Kovar, Jiri; Pokorny, Oldrich; Zuna, Jaroslav; Kratina, Jindrich; and Pellant, Michal, 4,129,881, Cl. 357-82.000.

Clark, Brian, to Societe d'Assistance Technique pour Produits Nestle S.A. Process for the extraction of vegetable materials. 4,129,665, Cl. 426-432.000.

Clark, Frederick P.; Johnson, Robert C.; and Topolewski, John, to Clorox Company, The. Liquid abrasive detergent composition and method for preparing same. 4,129,527, Cl. 252-547.000.

Clark, Norman O.; and Watson, James H. P., to English Clays Lovering Pochin & Co. Limited. Magnetic separation. 4,129,498, Cl. 209-213.000.

Classen, Alvin T. Spiral stair kit. 4,128,976, Cl. 52-187.000.

Clayton, Ruth M. Method for rapid screening of teratogenic agents. 4,129,643, Cl. 424-1.000.

Cleland, John W.; Westbrook, Russell D.; Wood, Richard F.; and Young, Rosa T., to United States of America, Energy. Improved polycrystalline silicon semiconducting material by nuclear transmutation doping. 4,129,463, Cl. 148-33.000.

Clement, Carl J.; Stengel, Fred H.; and Campbell, Kenneth S., to Monsanto Company. Wafer packaging system. 4,129,211, Cl. 206-213.100.

Clorox Company, The: *See*—
Clark, Frederick P.; Johnson, Robert C.; and Topolewski, John, 4,129,527, Cl. 252-547.000.

Cofer, Daniel B.; Ward, George C.; and Proctor, Dale D., to Southwire Company. Apparatus for producing a hot-formed product. 4,129,170, Cl. 164-270.000.

Cogliano, Joseph A.; and Kehr, Clifton L., to W. R. Grace & Co. Fabric softener urethane foam and method. 4,129,694, Cl. 521-107.000.

Colburn, Samuel E.; Bryant, Duane K.; Platz, Gerald M.; and Vetter, Clarence J., Jr., to National Distillers and Chemical Corporation. Ethylene copolymers and terpolymers containing vinyl esters of tertiary acids. 4,129,714, Cl. 526-331.000.

Cole, William M.: *See*—
Fieldhouse, John W.; Graves, Daniel F.; Cole, William M.; Stayer, Mark L.; and Fenske, Steven L., 4,129,529, Cl. 528-168.000.

Collier, Harry O. J.; Saeed, Sheikh A.; Schneider, Cyril; and Mannuzza, Frank. Method for reducing endogenous prostaglandin synthesis. 4,129,648, Cl. 424-101.000.

Collins, Alistair K.: *See*—
Wrycraft, Norman E.; and Collins, Alistair K., 4,129,236, Cl. 222-570.000.

Commissariat A l'Energie Atomique: *See*—
Aubert, Jacques; Carles, Maurice; and Neige, Roger, 4,129,481, Cl. 204-1.500.

Compagnie General d'Electricite S.A.: *See*—
Galaj, Stanislas; Hochon, Bernard; and Lerner, Pierre, 4,129,552, Cl. 260-45.9QB.

Compagnie Generale des Etablissements Michelin: *See*—
de Zarauz, Yves, 4,129,705, Cl. 526-175.000.

Conca, Gilbert G., to Transitube Project. Micro-proportioner apparatus for divided products. 4,129,234, Cl. 222-235.000.

Condon, Michael E.: *See*—
Ondetti, Miguel A.; and Condon, Michael E., 4,129,571, Cl. 260-326.200.

Confon AG, Firma: *See*—
Halm, Hans, 4,129,215, Cl. 209-610.000.

Conibear, Frank, to Woodstream Corporation. Actuator for animal trap. 4,128,961, Cl. 43-88.000.

Conklin, Harold E.; and Spector, George. Garden tray with pivoted handle. 4,128,912, Cl. 15-257.700.

Conrow, Ransom B.; and Bernstein, Seymour, to American Cyanamid Company. Ureylenebis(anionic substituted phenylene carbonyl)imino naphthalene sulfonic acids and naphthalene carboxylic acids and their salts. 4,129,590, Cl. 260-506.000.

Conrow, Ransom B.: *See*—
Bernstein, Seymour; Lenhard, Robert H.; and Conrow, Ransom B., 4,129,591, Cl. 260-506.000.

Contraves AG: *See*—
Ruegg, Andre; and Beck, Wilfried, 4,129,280, Cl. 248-183.000.

Control Process, Inc.: *See*—
Kent, David P., 4,129,053, Cl. 83-69.000.

Contronic Controls Limited: *See*—
Humphries, Peter E., 4,129,856, Cl. 340-554.000.

Cooper, Abraham J. Dowel receiving core for casting dental restorations. 4,129,281, Cl. 249-54.000.

Coors Container Company: *See*—
Talbott, Roblee L., 4,129,206, Cl. 198-377.000.

Copal Company Limited: *See*—
Ishiguro, Yasuo; and Wakazono, Kenji, 4,129,370, Cl. 354-234.000.
Okabe, Katsuhiko, 4,129,075, Cl. 101-99.000.

Corbett, John M.: *See*—
Park, Chung P.; Corbett, John M.; and Griffin, Warren H., 4,129,530, Cl. 521-79.000.

Corley, John C. Basting device. 4,129,066, Cl. 99-345.000.

Corrie, John D.: *See*—
Walker, Clarence H., Jr.; and Corrie, John D., 4,129,459, Cl. 148-4.000.

Corse, Louis G., to Machines Chambon. Apparatus for grooving sheet material. 4,129,065, Cl. 93-58.0ST.

Coupar, Robert B. Fluid substance transporting and storage tanks. 4,129,232, Cl. 222-173.000.

Courtaulds Limited: *See*—
Woodings, Calvin R., 4,129,679, Cl. 428-398.000.

Coutin, Pierre F.: *See*—
Hasquenoph, Jean H.; and Coutin, Pierre F., 4,129,271, Cl. 244-137.00R.

Cowan Plastic Products Corporation: *See*—
Marra, Michael R.; and Del Deo, Joseph, 4,128,955, Cl. 40-489.000.

Craig, John D., to Du Pont de Nemours, E. I., and Company. Aqueous acrylic coating composition for electrical conductors. 4,129,544, Cl. 260-29.300.

Credali, Lino; Baruzzi, Giovanni; and Guidotti, Vincenzo, to Montedison S.p.A. Reverse osmosis anisotropic membranes based on polypiperazine amides. 4,129,559, Cl. 528-337.000.

Crepaco, Inc.: *See*—
Wakeman, Alden H.; and Heiliger, Leonard R., 4,129,389, Cl. 366-144.000.

Cricchio, Renato, to Gruppo Lepetit S.p.A. Thiazolo-rifamycin derivatives and a method for their preparation. 4,129,562, Cl. 260-239.30P.

Crivello, Frank A.: *See*—
Kaufman, Michael P.; Kochenderfer, Randal S.; and Crivello, Frank A., 4,129,135, Cl. 131-243.000.

Cryer, Edward, to Lucas Industries Limited. Electrical switch assembly. 4,129,757, Cl. 200-4.000.

Cullen, Walter P.: *See*—
Celmer, Walter D.; Cullen, Walter P.; Jefferson, Mark T.; Moppett, Charles E.; Routien, John B.; and Sciavolino, Frank C., 4,129,578, Cl. 260-345.70R.

Cunningham, Thomas J.; Schwartzberg, Harold L., deceased; and McGlynn, Joseph L., Jr., executor, to RCA Corporation. Solder connection between copper and aluminum conductors. 4,129,744, Cl. 174-94.00R.

Cunningham, Virginia L., to Rohm and Haas Company. Poly(dimethylaminoethyl methacrylate) and method of preparation. 4,129,534, Cl. 521-38.000.

Cuntze, Ulrich: *See*—
Wallhausser, Karl H.; Cuntze, Ulrich; May, Adolf; and Bucking, Hans-Walter, 4,129,506, Cl. 252-8.800.

Cupp, William A., to AMF Incorporated. Product alignment mechanism. 4,129,207, Cl. 198-445.000.

Cusano, Dominic A.; Loughran, James A.; and Sun, Yen S. E. Double side cooled, pressure mounted semiconductor package and process for the manufacture thereof. 4,129,243, Cl. 228-122.000.

Custom Tool & Die Ltd.: *See*—
Golls, John W.; and Griep, Peter, 4,129,407, Cl. 425-87.000.

Cyprane North America, Inc.: *See*—
Jones, Wilfred; Jones, Keith W.; and Sweatman, Travers F., 4,129,621, Cl. 261-39.00R.

Czech, James I.; and Ruble, Ernest B., to Whirlpool Corporation. Assembly method for a motor. 4,128,935, Cl. 29-596.000.

Dabbous, Mahmoud K., to Standard Oil Company (Indiana). Miscible drive in heterogeneous reservoirs. 4,129,182, Cl. 166-263.000.

Dahms, Georg; and Kraus, Hubert, to Siemens Aktiengesellschaft. Method for the production of a layer capacitor. 4,128,927, Cl. 29-25.420.

Daiber, John W.; and Raymonda, John W., to Calspan Corporation. Method and apparatus for the continuous generation of metal vapor. 4,129,835, Cl. 331-94.50G.

Daimler-Benz Aktiengesellschaft: *See*—
Hoffmann, Rudiger, 4,129,143, Cl. 137-496.000.
Korner, Wolf-Dietrich; and Hartmann, Otto, 4,129,404, Cl. 417-364.000.
Schwuchow, Norbert, 4,129,330, Cl. 296-28.00F.

Damiano, Paul J., to United Technologies Corp. Fuel cell structure. 4,129,685, Cl. 429-38.000.

Dano, Pol, to Fansteel, Inc. Method for preparing a composite high strength to weight structure with fray resistance. 4,128,963, Cl. 264-46.600.

Dano, Pol: *See*—
Cecka, Andrew M.; Dano, Pol; and Pawling, Paul G., 4,129,634, Cl. 264-45.300.

Dardoufas, Kimon C.: *See*—
Marshall, Robert M.; Pak, Sung K.; and Dardoufas, Kimon C., 4,129,507, Cl. 252-8.900.

Dasher, George F.; and Fiebig, August E., Jr., to Alberto-Culver Company. Anti-static spray and method of use. 4,129,505, Cl. 252-8.800.

Daughdrill, E. Chris: *See*—
Bond, Ronald L.; Daughdrill, E. Chris; Brice, Henry T.; and Horton, Phineas E., III, 4,129,314, Cl. 280-425.00R.

Davis, Paul K., to Pacific Roller Die Co., Inc. Double wall helical pipe and strip configuration for forming same. 4,129,152, Cl. 138-154.000.

Davis, William D., to General Electric Company. Discriminating halogen sensor. 4,129,418, Cl. 422-98.000.

Davis, William E. Nut-cracking implement. 4,128,938, Cl. 30-120.300.

Dayton-Walther Corporation: *See*—
Walther, William D., 4,129,336, Cl. 301-12.00R.

de Bakker, Jacques: *See*—
Irnich, Werner; and de Bakker, Jacques, 4,129,133, Cl. 128-419.0PG.

De Ceuleneer, Adolf: *See*—
France, James R.; Buchan, John D.; Tyrer, Richard G.; De Ceuleneer, Adolf; and Van Steenkiste, Robert, 4,129,091, Cl. 118-50.000.

Deckard, John I.: *See*—
Bader, Ernest, Jr.; Deckard, John I.; and Kuiper, Dan B., 4,129,253, Cl. 239-88.000.
Bader, Ernest, Jr.; Deckard, John I.; and Kuiper, Dan B., 4,129,254, Cl. 239-96.000.
Bader, Ernest, Jr.; Deckard, John I.; and Kuiper, Dan B., 4,129,255, Cl. 239-96.000.
Bader, Ernest, Jr.; Deckard, John I.; and Kuiper, Dan B., 4,129,256, Cl. 239-96.000.

de Cointet de Fillain, Paul: *See*—
Pigerol, Charles; de Cointet de Fillain, Paul; and Bazile, Yves, 4,129,572, Cl. 260-326.12R.

Deflandre, Jean; Matarasso, Pierre; and Traisnel, Jean-Pierre, to Agence Nationale de Valorisation de la Recherche (ANVAR). Heliostats. 4,129,360, Cl. 350-289.000.

Defranould, Philippe, to Thomson-CSF. Piezo-resistive device for the electrical read-out of an optical image. 4,129,798, Cl. 310-313.000.

de Franza, Alfred: *See*—
Nowick, Chester R.; and de Franza, Alfred, 4,129,410, Cl. 432-31.000.

Degras, James C.; and Lee, David N., to General Motors Corporation. Adjusting method and clip for retractor lock bar. 4,129,267, Cl. 242-107.40A.

deGuzman, Norberto T.: *See*—
Pressman, Berton C.; and deGuzman, Norberto T., 4,129,659, Cl. 424-283.000.

Dehn Holding A/S: *See*—
Hoeholt, Steffen, 4,129,332, Cl. 297-440.000.

Del Norte Technology, Inc.: *See*—
Parker, William H., 4,129,184, Cl. 166-315.000.

Del Deo, Joseph: *See*—
Marra, Michael R.; and Del Deo, Joseph, 4,128,955, Cl. 40-489.000.

Delecki, Daniel J.: *See*—
Stein, Reinhardt P.; and Delecki, Daniel J., 4,129,561, Cl. 260-239.0BB.

Demers, Arthur S.; and Hilz, Lloyd A., to Montreal Engineering Company, Limited. Under ice pipelaying. 4,129,011, Cl. 405-169.000.

DeMoss, Dean: *See*—
Ragle, Herbert U.; and DeMoss, Dean, 4,129,891, Cl. 360-98.000.

DeMusis, Ralph T. Method of restoring worn turbine components. 4,128,929, Cl. 29-156.80B.

Dennis, Richard: *See*—
Deutsch, Albert A.; Dennis, Richard; and Gumbinner, Robert, 4,129,486, Cl. 204-159.190.

Depouilly, Bernard M. H.; and Issenmann, Edouard M. J. A. I., to Le Material Telephonique. Telephone exchange signalling unit. 4,129,756, Cl. 179-175.20R.

Desmond, Timothy F.: *See*—
Anderson, George J.; Desmond, Timothy F.; and Santer, J. Owen, 4,129,681, Cl. 428-524.000.

Deutsch, Albert A.; Dennis, Richard; and Gumbinner, Robert, to Polychrome Corporation. Ultraviolet curing printing inks having improved shelf life. 4,129,486, Cl. 204-159.190.

Deutsche Babcock Aktiengesellschaft: *See*—
Thelen, Franz; and Weber, Henning, 4,129,004, Cl. 60-652.000.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See*—
Buder, Wolfgang; Pletka, Hans-Dieter; Michel, Rudolf; Schwarz, Rudolf; and Dusing, Gerhard, 4,129,585, Cl. 260-448.80R.
Maierhofer, Alfred; and Wagner, Hans, 4,129,593, Cl. 562-557.000.

Deveney, Charles H., to Aluminum Company of America. Method and apparatus for forming elongated, tapered wall shells. 4,129,024, Cl. 72-329.000.

Deverell, Christopher; and Wells, Ronald W., to Imperial Chemical Industries Limited. Splicing process and apparatus. 4,129,469, Cl. 156-157.000.

Devine, Thomas M., Jr., to General Electric Company. Inertia welding process for making an anode assembly. 4,129,241, Cl. 228-113.000.

de Wit, Hendrik, to Hunter Douglas International N.V. Weight and weight end piece for vertical slat blind. 4,128,914, Cl. 16-1.00R.

DeWitt, Marion A., to Goodyear Tire & Rubber Company, The. Pneumatic tire. 4,129,162, Cl. 152-354.0RB.

de Zarauz, Yves, to Compagnie Generale des Etablissements Michelin. Polymerization process. 4,129,705, Cl. 526-175.000.

D'Hardmemare, Christian: *See*—
Moll, Manfred; D'Hardmemare, Christian; and Midoux, Nicolas, 4,129,029, Cl. 73-19.000.

Dhein, Rolf; and Fleiter, Lothar, to Bayer Aktiengesellschaft. Air-drying acrylate lacquer binders. 4,129,537, Cl. 260-23.0EP.

D'Hondt, August J. Plant stake. 4,128,965, Cl. 47-47.000.

DHP Corporation: *See*—
Longo, James J., 4,129,456, Cl. 134-1.000.

Diamond Shamrock Corporation: *See*—
Pohto, Gerald R.; and Olson, Richard O., 4,129,292, Cl. 269-126.000.
Tighe, Michael R.; and McCutchen, Hugh L., 4,129,493, Cl. 204-228.000.

Dias, J. Fleming; Karrer, Henry E.; and Tykulsky, Alexander, to Hewlett-Packard Company. High fidelity pressure transducer. 4,129,242, Cl. 228-121.000.

Dickson, Donald E.: *See*—
Glunz, Louis J.; and Dickson, Donald E., 4,129,575, Cl. 260-343.210.
Glunz, Louis J.; and Dickson, Donald E., 4,129,576, Cl. 260-343.210.

Dickson, Jocelyn: *See*—
Hermann, William J., Jr., 4,129,419, Cl. 422-64.000.

Dickson, John F.; and Wilcock, John D., to Plessey Handel und Investments AG. Electrical integrated circuit chips. 4,129,794, Cl. 307-270.000.

DIEHL: *See*—
Bedall, Hans; and Rentzsch, Max, 4,129,061, Cl. 86-20.00B.

Dieterich, Dieter: *See*—
Markusch, Peter; Dieterich, Dieter; and Dietrich, Manfred, 4,129,696, Cl. 521-154.000.

Dietrich, Manfred: *See*—
Markusch, Peter; Dieterich, Dieter; and Dietrich, Manfred, 4,129,696, Cl. 521-154.000.
Dietz, Bernhard, to Bruno Albrecht KG. Film projector. 4,129,364, Cl. 353-99.000.
DiMarco, Bernard: *See*—
Keller, Frank R.; Cataldo, John B.; Kussy, Frank W.; and DiMarco, Bernard, 4,129,843, Cl. 335-174.000.
Dimmick, Joseph G.; Weingartner, William J.; Fields, Alan S.; Fairhead, Donald L.; and Musson, Rosemary, to United States of America, Navy. Combination pursuit and compensatory display system. 4,129,087, Cl. 114-144.00E.
Doi, Toshio: *See*—
Soeno, Ko; Iizuka, Tomio; Doi, Toshio; Ando, Hisashi; Oyama, Testuo; Sakamoto, Hiroshi; and Misumi, Akira, 4,129,801, Cl. 313-346.00R.
Dolan, James P., to ADS Systems, Inc. Sensing apparatus and method. 4,129,030, Cl. 73-23.000.
Dolan, John W. Arm wrestling device. 4,129,297, Cl. 272-67.000.
Doring, Gerhard, to Julius & August Erbsloh, Firma. Method of making a thermally insulated window frame. 4,128,934, Cl. 29-460.000.
Dorius, John O., to Elsters, Inc. Exhaust hood canopy having a multi slot venturi outlet. 4,129,121, Cl. 126-299.00D.
Dornan, Arthur E., to Massey-Ferguson Inc. Control arrangement. 4,129,047, Cl. 74-474.000.
Dout, James A.; and Foreman, Robert E., to Sterilaire Medical, Inc. Patient isolation room with laminar flow feature. 4,129,122, Cl. 128-1.00R.
Dow Chemical Company, The: *See*—
Childress, David L.; Hayes, William V.; and Poppe, Richard L., 4,129,600, Cl. 260-604.00R.
McKendry, Lennon H., 4,129,733, Cl. 544-131.000.
McKendry, Lennon H., 4,129,734, Cl. 544-131.000.
Park, Chung P.; Corbett, John M.; and Griffin, Warren H., 4,129,530, Cl. 521-79.000.
Dowbenko, Rostyslaw: *See*—
Christenson, Roger M.; Dowbenko, Rostyslaw; and Makhlouf, Joseph M., 4,129,489, Cl. 204-159.220.
Downer, John M.; Rodway, William G.; and Shipp, Lawrence S. J., to Imperial Chemical Industries Limited. Tetrafluoroethylene polymers. 4,129,618, Cl. 260-884.000.
Doyle, Walter M. Film thickness measuring apparatus and method. 4,129,781, Cl. 250-341.000.
Dracon Industries: *See*—
Chavannes, Theodore E., 4,129,788, Cl. 307-11.000.
Draiswerke GmbH: *See*—
Engels, Kaspar; and Wilhelm, Karlheinz, 4,129,261, Cl. 241-46.110.
Dreikorn, Hans W.: *See*—
Hannes, George J.; Rohweder, Theodore R.; Dreikorn, Hans W.; and Shepherd, Philip B., 4,129,674, Cl. 428-285.000.
Dreyer, Dennis G.; Foley, Edward M.; and Rogers, Herbert E., Jr., to Cabot Corporation. Power metallurgy compacts and products of high performance alloys. 4,129,444, Cl. 75-251.000.
Du-Al Manufacturing Company: *See*—
Mott, Richard H.; and Pritchard, Clyde L., 4,129,258, Cl. 239-650.000.
Dubois, Grant E.: *See*—
Escher, Sina; and Dubois, Grant E., 4,129,599, Cl. 260-586.00E.
Duke, Edward D.; and Riordan, Joan M., to International Harvester Company. Mechanical chain adjuster for scraper elevator chains. 4,128,952, Cl. 37-8.000.
Dunbar, George W. Flashlight with a rotatable lamp holder. 4,129,899, Cl. 362-109.000.
Dunker, Gerhard: *See*—
Hildebrand, Helmut; and Dunker, Gerhard, 4,129,841, Cl. 333-84.00L.
Dunnington, Bruce W.; and Gernert, William B., to Glennel Corporation. Abrasive drill. 4,128,971, Cl. 51-204.000.
Duo-Fast Corporation: *See*—
Geist, Bernard W., 4,129,240, Cl. 227-8.000.
Du Pont de Nemours, E. I., and Company: *See*—
Craig, John D., 4,129,544, Cl. 260-29.300.
Noyes, Paul R., 4,129,547, Cl. 260-33.40R.
Scott, Paul T., 4,129,675, Cl. 428-288.000.
Dupont, John A.: *See*—
Greenfield, Stanley A.; and Dupont, John A., 4,129,448, Cl. 106-15.00R.
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., to Smith, Kline & French Laboratories Limited. Imidazole guanidines and use as inhibitors of histamine activity. 4,129,657, Cl. 424-273.00R.
Dusing, Gerhard: *See*—
Buder, Wolfgang; Pletka, Hans-Dieter; Michel, Rudolf; Schwarz, Rudolf; and Dusing, Gerhard, 4,129,585, Cl. 260-448.80R.
Duttweiler, Donald L., to Bell Telephone Laboratories, Incorporated. Echo canceller using feedback to improve speech detector performance. 4,129,753, Cl. 179-170.200.
Dvorak, Charles: *See*—
Roszkowski, Adolph P.; Beard, Colin C.; Dvorak, Charles; and Weinhardt, Klaus, 4,129,661, Cl. 424-273.00R.
E & I Corporation: *See*—
Lowry, John A., 4,129,262, Cl. 241-197.000.
E. R. Squibb & Sons, Inc.: *See*—
Hoehn, Hans, 4,129,738, Cl. 544-281.000.
Ondetti, Miguel A.; and Natarajan, Sehsea I., 4,129,566, Cl. 546-326.000.
Ondetti, Miguel A.; and Condon, Michael E., 4,129,571, Cl. 260-326.200.
Slusarchyk, William A.; Gordon, Eric M.; and Koster, William H., 4,129,731, Cl. 544-21.000.
Eastman Kodak Company: *See*—
Irick, Gether, Jr.; Kelly, Charles A.; and Martin, James C., 4,129,723, Cl. 542-416.000.
Eaton Corporation: *See*—
Hammond, Howard A.; and Sardina, John F., 4,129,194, Cl. 180-68.500.
Ebara Corporation: *See*—
Konno, Daisuke; and Tanaka, Tetsuo, 4,129,306, Cl. 277-30.000.
Ebauches SA: *See*—
Robert-Grandpierre, Jean-Claude, 4,128,991, Cl. 58-23.00R.
Ebbert, LeRoy W. Steerable wheel vehicle suspension system. 4,129,316, Cl. 280-96.100.
Eberhardt, Harry A., to Hale Fire Pump Company. Self-priming centrifugal trash pump. 4,129,402, Cl. 415-53.00R.
Eby, Robert S.: *See*—
Stephenson, Michael J.; and Eby, Robert S., 4,129,425, Cl. 55-44.000.
Eda, Tadahiro: *See*—
Miyakawa, Seiichi; and Eda, Tadahiro, 4,129,375, Cl. 355-10.000.
Edmund Scientific Company: *See*—
Bressler, Peter W., 4,129,278, Cl. 248-165.000.
Edwards, Albert, to Baker Perkins Holdings Limited. Preparation of foundry moulds and cores. 4,129,165, Cl. 164-7.000.
Eggensperger, Heinz; and Beilfuss, Wolfgang, to Sterling Drug Inc. Aqueous peroxy-containing concentrate. 4,129,517, Cl. 252-186.000.
Egger, Joseph; Mayer, Franz; Schwartz, Herbert; Sodler, Walter; Suard, Jean; and Tilse, Wilhelm, to Timex Corporation. Rocking motor for low cost quartz watch. 4,128,992, Cl. 58-23.00D.
Egger, Kurt: *See*—
Ogrisek, Harriet H.; and Egger, Kurt, 4,129,379, Cl. 355-57.000.
Eggert, Uwe. Jet mouth piece. 4,129,257, Cl. 239-458.000.
Eichinger, Johann; and Hirt, Manfred, to Carl Hurth Maschinen- und Zahnradfabrik. Pivot pin for joints, particularly universal joints or the like. 4,129,394, Cl. 403-57.000.
Eigenmann, Ludwig. Snowplowing resisting road surface marking tape material. 4,129,673, Cl. 428-172.000.
Ekman, Lars; and Norman, Helge, to Norman, Helge. Bath equipment for disabled persons. 4,128,904, Cl. 4-185.00L.
Elcik, Robert G., to Stauffer Chemical Company. Fire retardant polyvinyl chloride containing compositions. 4,129,535, Cl. 260-23.0XA.
Electric Power Research Institute, Inc.: *See*—
Benke, Frank W., 4,129,845, Cl. 336-57.000.
Welk, Steven, 4,129,849, Cl. 338-21.000.
Electricity Council, The: *See*—
Jones, Ivor W.; Robinson, Graham; and Bird, Thomas L., 4,129,690, Cl. 429-104.000.
Electrohome Limited: *See*—
Anthony, Patrick R., 4,129,884, Cl. 358-188.000.
Shih, Martin K. S., 4,129,886, Cl. 358-194.000.
Elektro-Apparatebau Olten A.G.: *See*—
Thalmann, Rene A., 4,129,124, Cl. 128-2.05T.
Eli Lilly and Company: *See*—
Michel, Karl H.; and Higgens, Calvin E., 4,129,721, Cl. 536-17.000.
Eliades, Theo I.; Muir, Ronald J.; and Horner, James D., to Surpass Chemicals Limited. Over-based magnesium salts of sulphonic acids. 4,129,589, Cl. 260-504.00A.
Elias, Robert T.: *See*—
Butterworth, George A. M.; Elias, Robert T.; and Miller, Wayne D., 4,129,132, Cl. 128-287.000.
Ellison, Francis D. Method of making a surgical cast. 4,129,127, Cl. 128-89.00R.
Ellison, Robert A.; and Kotsonis, Frank N., to Wisconsin Alumni Research Foundation. Derivative of T-2 toxin and anguidine. 4,129,577, Cl. 260-345.200.
Elsbett, Gunter: *See*—
Elsbett, Ludwig; and Elsbett, Gunter, 4,129,108, Cl. 123-193.00P.
Elsbett, Ludwig; and Elsbett, Gunter. Piston for internal combustion engines. 4,129,108, Cl. 123-193.00P.
El-Souessi, Monti; Laffay, Gilbert; and Neuschwander, Jean-Christian. Impact device for marking, punching, stamping, forming, riveting and other related operations. 4,129,188, Cl. 173-120.000.
Elsters, Inc.: *See*—
Dorius, John O., 4,129,121, Cl. 126-299.00D.
Emary, Robert J.: *See*—
Rosencwaig, Allan; and Emary, Robert J., 4,129,385, Cl. 356-244.000.
Emmett, John C.: *See*—
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,129,657, Cl. 424-273.00R.
Endo, Shunzo: *See*—
Murayama, Naohiro; Nakamura, Kenichi; and Endo, Shunzo, 4,129,608, Cl. 260-836.000.
Engelhardt, Roland: *See*—
Racine, Philippe; Higelin, Jean-Claude; Engelhardt, Roland; and Mindt, Wolfgang, 4,129,478, Cl. 204-1.00T.
Engels, Kaspar; and Wilhelm, Karlheinz, to Draiswerke GmbH. Agitating mill. 4,129,261, Cl. 241-46.110.
English Clays Lovering Pochin & Co. Limited: *See*—
Clark, Norman O.; and Watson, James H. P., 4,129,498, Cl. 209-213.000.

Erckel, Rudiger: *See—*
Gunther, Dieter; Schinzel, Erich; Erckel, Rudiger; and Rosch, Gunter, 4,129,412, Cl. 8-1.00W.

Erickson, Marlo W. V.; and Volk, Stanley W. Variable gear ratio chain drive system for bicycles. 4,129,044, Cl. 74-244.000.

Erik Sorberg Armaturfabrik Aktiebolag: *See—*
Brehmer, Roland; and Sorberg, Bengt, 4,129,149, Cl. 137-599.100.

Erwin Sick Gesellschaft mit beschrankter Haftung Optik-Elektronik: *See—*
Francke, Erwin, 4,129,814, Cl. 318-577.000.

Escher, Sina; and Dubois, Grant E., to Leland Stanford Jr. University, The Board of Trustees of. A-Norsteroids. 4,129,599, Cl. 260-586.00E.

Escher Wyss Limited: *See—*
Miller, Helmut, 4,129,786, Cl. 290-52.000.

Espinosa, Albert. Portable driver emergency device. 4,129,857, Cl. 340-321.000.

Etablissement Dentaire Ivoclar: *See—*
Schleich, Hans B., 4,128,942, Cl. 32-32.000.

Etablissements P. Ferbeck & Vincent: *See—*
Baudin, Bernard, 4,129,081, Cl. 10-238.000.

Etchu, Masami; Yamaguchi, Takao; and Takagi, Norio, to Teijin Limited. Process for producing thermoplastic resin films having reduced thickness unevenness. 4,129,630, Cl. 264-22.000.

Etoh, Motoaki, to Fuji Jukogyo Kabushiki Kaisha. Fuel changeover system for multi-fuel engines. 4,129,620, Cl. 261-18.00R.

Eurotungstene: *See—*
Walrave, Jean, 4,128,933, Cl. 29-420.500.

Everett, Wilhelm S. Fluid acoustic silencer. 4,129,196, Cl. 181-280.000.

Exxon Research & Engineering Co.: *See—*
Horowitz, Harold S.; Longo, John M.; and Lewandowski, Joseph T., 4,129,525, Cl. 252-518.000.
Moss, Gerald, 4,129,411, Cl. 432-58.000.

Fabert, Herman A., Jr.: *See—*
Ridenour, Charles E.; Fabert, Herman A., Jr.; Tasker, John; and Larson, Hugo R., 4,129,773, Cl. 219-146.230.

Fage, Etienne, to Astech. Single-skin thrust reverser for aircraft jet engines. 4,129,269, Cl. 244-110.00B.

Fahim, Atef E. F.; and Cheng, Richard M. H. Fluid operated stepping motor. 4,129,064, Cl. 92-129.000.

Fairhead, Donald L.: *See—*
Dimmick, Joseph G.; Weingartner, William J.; Fields, Alan S.; Fairhead, Donald L.; and Musson, Rosemary, 4,129,087, Cl. 114-144.00E.

Fakla, Istvan E.; and Grote, Reinhard, to USM Corporation. Hot melt adhesives for cellulosic material. 4,129,539, Cl. 260-27.00R.

Falk Construction, Inc.: *See—*
Tansill, Horace A., 4,128,951, Cl. 36-44.000.

Fancy, Richard E., to General Motors Corporation. Seat belt securing device. 4,129,320, Cl. 280-744.000.

Fang, Dieter: *See—*
Huppert, Karl-Ludwig; and Fang, Dieter, 4,129,518, Cl. 252-301.10W.

Fansteel, Inc.: *See—*
Cecka, Andrew M.; Dano, Pol; and Pawling, Paul G., 4,129,634, Cl. 264-45.300.
Dano, Pol, 4,128,963, Cl. 264-46.600.

Farrissey, William J., Jr.: *See—*
Chen, Augustin T.; Farrissey, William J., Jr.; and Nelb, Robert G., II, 4,129,715, Cl. 528-67.000.

Fava, Ronald A., to ARCO Polymers, Inc. Thermoplastic molding composition of polymethyl methacrylate and rubber modified styrene-maleimide. 4,129,614, Cl. 260-876.00B.

Fava, Ronald A., to ARCO Polymers, Inc. Plastic alloy of copolymers. 4,129,615, Cl. 260-876.00B.

Fava, Ronald A., to ARCO Polymers, Inc. Moldable blend of polymethyl methacrylate and styrene-maleimide. 4,129,619, Cl. 260-901.000.

Favorite Manufacturing, Inc.: *See—*
Burkholder, Harvey Z., 4,129,279, Cl. 248-165.000.

Fazis, Harald, to Ludwig Boschert, Maschinen- und Apparatebau GmbH & Co. KG. Punching press. 4,129,054, Cl. 83-165.000.

Feldy, Edmund C.; and Stephens, Dennis L., to Teletype Corporation. Stepping motor control circuit. 4,129,816, Cl. 318-696.000.

Fenske, Steven L.: *See—*
Fieldhouse, John W.; Graves, Daniel F.; Cole, William M.; Stayer, Mark L.; and Fenske, Steven L., 4,129,529, Cl. 528-168.000.

Ferrarini, James; and Kuehn, Erich, to ICI Americas Inc. Method of shaping ethylenically unsaturated monomer solutions containing urylated linear polyester/polyurethane resins. 4,129,641, Cl. 264-294.000.

Fiat-Allis Construction Machinery, Inc.: *See—*
Keyzer, Carl A., 4,129,001, Cl. 60-403.000.

Fick, Edwin O., Jr.; and Bell, Edward L., to Madison Foods, Inc. Method and apparatus for processing pork sides. 4,128,916, Cl. 17-52.000.

Fiebig, August E., Jr.: *See—*
Dasher, George F.; and Fiebig, August E., Jr., 4,129,505, Cl. 252-8.800.

Fieldhouse, John W.; Graves, Daniel F.; Cole, William M.; Stayer, Mark L.; and Fenske, Steven L., to Firestone Tire & Rubber Company, The. Process for the production of phosphazene polymers. 4,129,529, Cl. 528-168.000.

Fields, Alan S.: *See—*
Dimmick, Joseph G.; Weingartner, William J.; Fields, Alan S.; Fairhead, Donald L.; and Musson, Rosemary, 4,129,087, Cl. 114-144.00E.

Fink, Helmuth; and Wess, Guenter, to Siemens Aktiengesellschaft. Circuit arrangement for determining and analyzing the phase interference-modulation of a measuring signal. 4,129,831, Cl. 324-57.00H.

Firestone Tire & Rubber Company, The: *See—*
Adams, Harold E.; Boutsicaris, Stephen P.; and Halasa, Adel F., 4,129,699, Cl. 526-42.000.
Fieldhouse, John W.; Graves, Daniel F.; Cole, William M.; Stayer, Mark L.; and Fenske, Steven L., 4,129,529, Cl. 528-168.000.
Kang, Jung W.; and Hergenrother, William L., 4,129,579, Cl. 260-346.110.

Fischer, Hermann, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft (M.A.N.). Dual feed inking system for offset printing machines. 4,129,077, Cl. 101-350.000.

Fischer, Horst: *See—*
Schwartzkopff, Udo; and Fischer, Horst, 4,129,097, Cl. 119-28.000.

Fischer, Karl; and Matetschlager, Walter, to U.S. Philips Corporation. Battery compartment in portable apparatus. 4,129,688, Cl. 429-97.000.

Fischer & Porter Co.: *See—*
Morrow, James J., 4,129,479, Cl. 204-1.00T.

Fitch, Robert H.; Kurtz, Bruce E.; and Smura, Bronislaw B., to Allied Chemical Corporation. Support structure for plural cell electrolyzer. 4,129,495, Cl. 204-279.000.

Flagg, John G. Cubic game board. 4,129,303, Cl. 273-241.000.

Flanigen, Edith M.; Lok, Brent M.; and Mumbach, Norbert R., to Union Carbide Corporation. Acetylene vessel filler composition. 4,129,450, Cl. 106-120.000.

Fleig, William C. Portable craft and hobby unit. 4,129,213, Cl. 206-575.000.

Fleischer, Robert L., to General Electric Company. Detection of subsurface air flow. 4,129,776, Cl. 250-253.000.

Fleiter, Lothar: *See—*
Dhein, Rolf; and Fleiter, Lothar, 4,129,537, Cl. 260-23.0EP.

Flex Ake Wennberg AB: *See—*
Furasen, Willy, 4,129,426, Cl. 55-217.000.

FMC Corporation: *See—*
Billett, Ronald J.; and Harper, Bruce M., 4,129,230, Cl. 221-268.000.
McKenzie, Elton L., 4,129,068, Cl. 99-538.000.
Solowy, Jean, 4,129,142, Cl. 137-492.000.

Fohl, Timothy, to GTE Sylvania Incorporated. Copy apparatus using chemical flashlamp. 4,129,380, Cl. 355-113.000.

Foley, Edward M.: *See—*
Dreyer, Dennis G.; Foley, Edward M.; and Rogers, Herbert E., Jr., 4,129,444, Cl. 75-251.000.

Foley, John D., Jr., to Ram-Trol, Inc. Divided cap hinge bracket. 4,129,088, Cl. 115-18.00E.

Foote, John P. Single shot rifle having falling breechblock integral with stock. 4,128,956, Cl. 42-23.000.

Ford Motor Company: *See—*
Kaufman, Sydney M., 4,129,443, Cl. 75-212.000.
Rogerson, Jerry B.; and Harrison, Robert S., 4,129,623, Cl. 261-52.000.

Fordyce, Homer E.; and Carter, William C., to Marley Company, The. Selectively controllable water curtain damper for inlet face of circular water cooling tower. 4,129,625, Cl. 261-111.000.

Foreman, Robert E.: *See—*
Dout, James A.; and Foreman, Robert E., 4,129,122, Cl. 128-1.00R.

Fort Wayne Wire Die, Inc.: *See—*
Bieberich, Paul, 4,129,052, Cl. 76-107.00A.

Fory, Werner: *See—*
Bellus, Daniel; Fory, Werner; and Tobler, Hans, 4,129,573, Cl. 260-326.450.

Foseco International Limited: *See—*
Jeffreys, Godfrey V.; Mumford, Clive J.; Ravault, Frank E. G.; and Washbourne, Colin, 4,129,500, Cl. 210-23.00R.

Foster, Gregory S., to Procter & Gamble Company, The. Heavy-duty liquid detergent and process. 4,129,515, Cl. 252-117.000.

France, James R.; Buchan, John D.; Tyrer, Richard G.; De Ceuleneer, Adolf; and Van Steenkiste, Robert. Impregnation apparatus having bias-opening means. 4,129,091, Cl. 118-50.000.

Francke, Erwin, to Erwin Sick Gesellschaft mit beschrankter Haftung Optik-Elektronik. Process for the formation of a comparison square wave signal. 4,129,814, Cl. 318-577.000.

Frank, Robert I.; and Salzer, Thomas E., to Raytheon Company. Platinum film resistor device. 4,129,848, Cl. 338-308.000.

Frank, Robert I.: *See—*
Kaplow, Roy; Frank, Robert I.; and Goodrich, Joel L., 4,129,458, Cl. 136-89.0PC.

Franz, Curtis A., to American Cyanamid Company. Stabilization of N,N'-[(thiocarbonyl)thio]dimorpholine. 4,129,452, Cl. 106-243.000.

Franzen, Larry H.: *See—*
Niles, Albert B.; Franzen, Larry H.; Gardner, William J.; and Grob, Russel W., 4,129,034, Cl. 73-117.300.

Frenkin, Ernest I.: *See—*
Nametkin, Nikolai S.; Vinogradov, Georgy V.; Podolsky, Jury Y.; Pavlovskaya, Nina T.; Frenkin, Ernest I.; and Yanovsky, Jury G., 4,129,550, Cl. 260-42.220.

Friedhofen, Gerhard: *See—*
Serini, Volker; Friedhofen, Gerhard; Frietag, Dieter; and Heuser, Jurgen, 4,129,612, Cl. 260-860.000.

Frietag, Dieter: *See—*
Serini, Volker; Friedhofen, Gerhard; Frietag, Dieter; and Heuser, Jurgen, 4,129,612, Cl. 260-860.000.

Friihauf, Edward J., to Lubrizol Corporation, The. Demulsifier additive compositions for lubricants and fuels and concentrates containing the same. 4,129,508, Cl. 252-33.000.

Friona, Anthony J.: *See—*
Carey, Lee F.; and Friona, Anthony J., 4,129,025, Cl. 72-348.000.

Friz, Walter, to Hay, Louis E. Traveling wave device with cast slow wave interaction structure and method for forming. 4,129,803, Cl. 315-3.500.
Fuji Jukogyo Kabushiki Kaisha: *See—*
Etoh, Motoaki, 4,129,620, Cl. 261-18.00R.
Fuji Photo Film Co., Ltd.: *See—*
Fujiwara, Masato; Takeda, Keiji; and Tsuboi, Masayoshi, 4,129,445, Cl. 96-29.00R.
Noguchi, Masaru, 4,129,355, Cl. 350-6.700.
Fujii, Etsuo: *See—*
Sato, Makoto; Takamatsu, Hiroshi; Miyagawa, Yoshitaka; and Fujii, Etsuo, 4,129,342, Cl. 303-105.000.
Fujii, Motoharu; Muramatsu, Takao; Koumura, Noboru; Sugiura, Susumu; Takekawa, Nobuhiro; and Tsukada, Syusei, to Canon Kabushiki Kaisha. Electrostatic printing. 4,129,072, Cl. 101-1.000.
Fujimori, Shigeo: *See—*
Torii, Kenichi; and Fujimori, Shigeo, 4,129,842, Cl. 334-15.000.
Fujita, Isao: *See—*
Taguchi, Kazumasa; Nishida, Tsutomu; Kitajima, Masaharu; Aketa, Kan; Fujita, Isao; Onoda, Mamoru; Imanishi, Nobuyuki; and Watanabe, Ryo, 4,129,437, Cl. 75-5.000.
Fujiwara, Hiroshi: *See—*
Machi, Sueo; Matsui, Yasushi; Sugishita, Akio; Sugo, Takanobu; Taniguchi, Hiroaki; Asano, Koichi; and Fujiwara, Hiroshi, 4,129,617, Cl. 260-879.000.
Fujiwara, Masato; Takeda, Keiji; and Tsuboi, Masayoshi, to Fuji Photo Film Co., Ltd. Metal image formation process. 4,129,445, Cl. 96-29.00R.
Fujiwara, Yasuo: *See—*
Koike, Sakae; Matsunami, Shoichi; and Fujiwara, Yasuo, 4,129,651, Cl. 423-235.000.
Fukuda, Mitsuhisa: *See—*
Ogura, Yukio; and Fukuda, Mitsuhisa, 4,129,373, Cl. 355-1.000.
Fukushima, Hideo; and Suzuki, Yoshikuni, to Nisshin Flour Milling Co., Ltd. Isocarbostyril derivatives. 4,129,565, Cl. 546-142.000.
Funakoshi, Kouji: *See—*
Amagami, Keizo; Nakamura, Masatatsu; Kominami, Hideyuki; Funakoshi, Kouji; Kiuchi, Mitsuyuki; and Mizukawa, Takumi, 4,129,767, Cl. 219-10.49R.
Furasen, Willy, to Flex Ake Wennberg AB. Device for cleaning workshop air. 4,129,426, Cl. 55-217.000.
Furr, Dale D., to Ceramic Cooling Tower Company. Tornado protected cooling tower. 4,129,627, Cl. 261-151.000.
Furukawa Denchi Kabushiki Kaisha: *See—*
Watakabe, Yuichi, 4,129,684, Cl. 429-27.000.
Furukawa, Yoshiyasu: *See—*
Marumoto, Ryuji M.; Furukawa, Yoshiyasu; and Kawai, Kiyohisa, 4,129,654, Cl. 424-251.000.
Futatsugi, Setsuo: *See—*
Gerstine, Milton I.; Goldberg, Joshua I.; Futatsugi, Setsuo; Ueda, Kazuo; Seo, Ryozo; Iwasaki, Koji; and Uemura, Makoto, 4,129,275, Cl. 244-181.000.
Fuxe, Kjell, to Nelson Research & Development Company. Method for potentiating neuroleptic drugs. 4,129,652, Cl. 424-247.000.
G. W. Taylor Industries Limited: *See—*
Taylor, Harry E., 4,128,974, Cl. 52-11.000.
Gaenge, Friedrich J.; Utner, Ferdinand; Vetter, Harald; and Vilsmeier, Gerhart, to Siemens Aktiengesellschaft. Method for the production of an electric stack capacitor of metallized synthetic material films. 4,128,926, Cl. 29-25.420.
GAF Corporation: *See—*
Lorenz, Donald H.; Tu, Shu-Tung; and Wyman, Donald P., 4,129,667, Cl. 427-44.000.
Lorenz, Donald H.; and Tu, Shu-Tung, 4,129,709, Cl. 526-264.000.
Strobel, Albert F., 4,129,521, Cl. 252-403.000.
Tracy, David J.; and Hoffstadt, Walter F., 4,129,739, Cl. 560-21.000.
Galaj, Stanislas; Hochon, Bernard; and Lerner, Pierre, to Compagnie General d'Electricite S.A. Insulation material for high voltage electric power cable. 4,129,552, Cl. 260-45.9QB.
Galani, Zvi; and Temple, Steven J., to Raytheon Company. Radio frequency energy combiner or divider. 4,129,839, Cl. 333-9.000.
Gamacher, Robert J. Integral applicator structure. 4,129,391, Cl. 401-208.000.
Gander, Robert J.; and Gurney, John A., to Johnson & Johnson. Retinoic acid derivatives for the treatment of acne. 4,129,662, Cl. 424-305.000.
Ganellin, Charon R.: *See—*
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,129,657, Cl. 424-273.00R.
Ganguly, Ashit K.; Girijavallabhan, Viyyoor M.; Sarre, Olga; and Reimann, Hans, to Schering Corporation. Aminoeverninomicin and derivatives thereof. 4,129,720, Cl. 536-17.000.
Gani, Venkappa L.; and Montegari, Frank A., to International Business Machines Corporation. High density integrated logic circuit. 4,129,790, Cl. 307-203.000.
Gardiner, Kenneth W.: *See—*
Hori, Tatsu; Gardiner, Kenneth W.; and Mangal, Norman F., 4,129,295, Cl. 271-186.000.
Gardner, Robert F. Color-keyed fabric for screen printing. 4,129,076, Cl. 101-127.000.
Gardner, William J.: *See—*
Niles, Albert B.; Franzen, Larry H.; Gardner, William J.; and Grob, Russel W., 4,129,034, Cl. 73-117.300.
Garner, Eugene F.; and Hamilton, Brian K., to Allied Chemical Corporation. Chlorite containing pyrotechnic composition and method of inflating an inflatable automobile safety restraint. 4,128,996, Cl. 60-205.000.
Garrett, Donald E., to Occidental Petroleum Corporation. Process for disposal of solid wastes. 4,129,440, Cl. 75-63.000.
Garrett, Michael E.; and Keene, Richard M. Liquid treatment process. 4,129,502, Cl. 210-60.000.
Garside, David, to Garwall Cooling Limited. Expendable refrigeration system. 4,129,432, Cl. 62-222.000.
Garvey, Louis P., to General Motors Corporation. Seat belt utilization recorder. 4,129,321, Cl. 280-744.000.
Garwall Cooling Limited: *See—*
Garside, David, 4,129,432, Cl. 62-222.000.
Geiger, Friedrich, to Kleindienst & Co. Maschinenfabrik, Firma. Ironing mangle with pneumatically pressurizable roller covering. 4,128,953, Cl. 38-56.000.
Geist, Bernard W., to Duo-Fast Corporation. Electric nailer. 4,129,240, Cl. 227-8.000.
Gelbart, Bernard. Mattress foundation apparatus. 4,128,907, Cl. 5-200.00R.
Gendron, Wilfred H., to Westvaco Corporation. Two compartmented envelope. 4,129,214, Cl. 206-629.000.
General Dynamics Corporation: *See—*
Schuler, Alan L., 4,129,146, Cl. 137-587.000.
General Electric Company: *See—*
Axelrod, Robert J.; Mark, Victor; and Wilson, Phillip S., 4,129,546, Cl. 260-31.80T.
Bigelow, John E.; and Peroutky, Donald C., 4,129,390, Cl. 400-121.000.
Davis, William D., 4,129,418, Cl. 422-98.000.
Devine, Thomas M., Jr., 4,129,241, Cl. 228-113.000.
Fleischer, Robert L., 4,129,776, Cl. 250-253.000.
Hallgren, John E., 4,129,574, Cl. 260-340.200.
Houston, John M., 4,129,783, Cl. 250-445.00T.
Johansson, Eric B.; Klahn, Dale H.; and Marlowe, Mickey O., 4,129,477, Cl. 176-73.000.
Kingsley, Jack D.; and Yang, Kei-Hsiung, 4,129,779, Cl. 250-315.00A.
Michon, Gerald J., 4,129,887, Cl. 358-213.000.
Schaeffer, Robert L., 4,128,939, Cl. 30-123.000.
Shotts, L. D.; Wisbey, Raymond W.; and Sears, Albert W., 4,128,928, Cl. 29-156.80B.
Sigsbee, Raymond A., 4,129,166, Cl. 164-46.000.
Sigsbee, Raymond A., 4,129,167, Cl. 164-46.000.
Tantraporn, Wirojana; and Yu, Se P., 4,129,879, Cl. 357-22.000.
Tehon, Stephen W.; and Pruski, Edward M., 4,129,031, Cl. 73-32.00A.
Toot, Peter D., 4,128,995, Cl. 60-204.000.
White, Dwain M., 4,129,555, Cl. 260-823.000.
Witting, Harald L., 4,129,895, Cl. 361-257.000.
General Instrument Corporation: *See—*
Reinholtz, William H., 4,129,888, Cl. 360-40.000.
General Motors Corporation: *See—*
Bader, Ernest, Jr.; Deckard, John I.; and Kuiper, Dan B., 4,129,253, Cl. 239-88.000.
Bader, Ernest, Jr.; Deckard, John I.; and Kuiper, Dan B., 4,129,254, Cl. 239-96.000.
Bader, Ernest, Jr.; Deckard, John I.; and Kuiper, Dan B., 4,129,255, Cl. 239-96.000.
Bader, Ernest, Jr.; Deckard, John I.; and Kuiper, Dan B., 4,129,256, Cl. 239-96.000.
Boyer, James A., 4,129,107, Cl. 123-146.50A.
Degras, James C.; and Lee, David N., 4,129,267, Cl. 242-107.40A.
Fancy, Richard E., 4,129,320, Cl. 280-744.000.
Garvey, Louis P., 4,129,321, Cl. 280-744.000.
Howarth, David S., 4,129,099, Cl. 123-32.0EE.
Rashid, Moinuddin S., 4,129,461, Cl. 148-12.300.
Yew, Ming-Chih; and Jones, Trevor O., 4,129,817, Cl. 320-18.000.
General Signal Corporation: *See—*
Polimine, Robert F., 4,129,354, Cl. 339-265.00F.
Svet, Frank A., 4,129,276, Cl. 246-169.00S.
General Tire & Rubber Company, The: *See—*
Gormish, Kenneth J.; and Hofelt, Clarence, Jr., 4,128,969, Cl. 51-106.00R.
Georg Spiess GmbH: *See—*
Marass, Josef, 4,129,294, Cl. 271-93.000.
Gerling Moore, Inc.: *See—*
Anderson, Eldon E., 4,129,768, Cl. 219-10.55A.
Gernert, William B.: *See—*
Dunnington, Bruce W.; and Gernert, William B., 4,128,971, Cl. 51-204.000.
Gershaw, Nathan: *See—*
Barnett, Gabriel; Gershaw, Nathan; and Mausner, Jack J., 4,129,645, Cl. 424-60.000.
Gerstine, Milton I.; Goldberg, Joshua I.; Futatsugi, Setsuo; Ueda, Kazuo; Seo, Ryozo; Iwasaki, Koji; and Uemura, Makoto, to Boeing Company, The; and Kawasaki Jukogyo Kabushiki Kaisha. Automatic flight control apparatus for aircraft. 4,129,275, Cl. 244-181.000.
Gesellschaft zur Wiederaufarbeitung von Kernbrennstoffen mbH: *See—*
Huppert, Karl-Ludwig; and Fang, Dieter, 4,129,518, Cl. 252-301.10W.
Gewartowski, Steve A., to UOP Inc. Temperature control of integrated fractionation column and reaction zone. 4,129,606, Cl. 260-674.00R.
Giglia, Robert D., to American Cyanamid Company. Multiplex addressing of electrochromic displays. 4,129,861, Cl. 340-324.00R.
Gilano, Michael N.; and Hayes, James C., to Telaris Telecommunications, Inc. Keyboard switch assembly having flexible contact carry-

ing member between contact carrying substrate and flexible, resilient, key-depressible bubble protrusions. 4,129,758, Cl. 200-5.00A.

Gilbert, John R. B.: *See—*
Morton, Peter H.; Gilbert, John R. B.; and Wortley, John P. A., 4,129,492, Cl. 204-212.000.

Gilford Instrument Laboratories: *See—*
Rosencwaig, Allan; and Emary, Robert J., 4,129,385, Cl. 356-244.000.

Girijavallabhan, Viyyoor M.: *See—*
Ganguly, Ashit K.; Girijavallabhan, Viyyoor M.; Sarre, Olga; and Reimann, Hans, 4,129,720, Cl. 536-17.000.

Giudicelli, Don P. R. L.; and Najer, Henry, to Synthelabo. Phenylethylamine derivatives. 4,129,598, Cl. 260-570.80R.

Gladwin, Floyd R. Continuous slab casting mold. 4,129,175, Cl. 164-444.000.

Glasser, Alan; Schwarz, Jens P.; and Glasser, Lance A., to Glasser, Alan; and Schwarz, Jens P. Heat exchange apparatus. 4,129,112, Cl. 126-121.000.

Glasser, Lance A.: *See—*
Glasser, Alan; Schwarz, Jens P.; and Glasser, Lance A., 4,129,112, Cl. 126-121.000.

Glaverbell: *See—*
Plumat, Emile; and Posset, Robert, 4,129,434, Cl. 65-60.00D.

Glennel Corporation: *See—*
Dunnington, Bruce W.; and Gernert, William B., 4,128,971, Cl. 51-204.000.

Glunz, Louis J.; and Dickson, Donald E., to Thomas C. Elder, Inc. 8-Methoxypsoralen. 4,129,575, Cl. 260-343.210.

Glunz, Louis J.; and Dickson, Donald E., to Thomas C. Elder, Inc. Process for making ω-chloro-2,3,4-trihydroxyacetophenone. 4,129,576, Cl. 260-343.210.

Godtschalck, Lucien J., to Krieg & Zivy Industries. Structure for supporting and guiding a drawer. 4,129,347, Cl. 312-330.00R.

Gogolin, Robert L.; and Spisak, Steve, to TRW Inc. Plunge dampener. 4,129,770, Cl. 219-98.000.

Gogolok, Konrad: *See—*
Roth, Michael; and Gogolok, Konrad, 4,129,447, Cl. 106-2.000.

Goldberg, Joshua I.: *See—*
Gerstine, Milton I.; Goldberg, Joshua I.; Futatsugi, Setsuo; Ueda, Kazuo; Seo, Ryozo; Iwasaki, Koji; and Uemura, Makoto, 4,129,275, Cl. 244-181.000.

Goldman, Stephen R. Radio telephone communications system. 4,129,749, Cl. 179-2.0EB.

Goldsby, Claude W.; and Sandau, Roray J. Heat extractor for stoves. 4,129,251, Cl. 237-51.000.

Golls, John W.; and Griep, Peter, to Custom Tool & Die Ltd. Curvature and pressure regulator for trowelling bars of mastic applicator and finishing tools. 4,129,407, Cl. 425-87.000.

Gonzalez, Neil. Vehicular trunk lock replacement plate. 4,129,020, Cl. 70-417.000.

Goodrich, Joel L.: *See—*
Kaplow, Roy; Frank, Robert I.; and Goodrich, Joel L., 4,129,458, Cl. 136-89.0PC.

Goodyear Tire & Rubber Company, The: *See—*
DeWitt, Marion A., 4,129,162, Cl. 152-354.0RB.

Gordon, Eric M.: *See—*
Slusarchyk, William A.; Gordon, Eric M.; and Koster, William H., 4,129,731, Cl. 544-21.000.

Gordon, Wolfgang, to Hoechst Aktiengesellschaft. Process for making hydrophilic polyolefin fibers containing clay. 4,129,629, Cl. 264-13.000.

Gore, Thomas A. Reporting device. 4,129,754, Cl. 179-188.000.

Gormish, Kenneth J.; and Hofelt, Clarence, Jr., to General Tire & Rubber Company, The. Apparatus for reducing tangential force variation in pneumatic tires. 4,128,969, Cl. 51-106.00R.

Goto, Masuo; Isono, Akira; Momochi, Yasushi; and Kai, Takaaki, to Hitachi, Ltd. Excitation control apparatus suited for normal stop operation of synchronous generators. 4,129,818, Cl. 322-10.000.

Gould Inc.: *See—*
Biddick, Royce E., 4,129,633, Cl. 264-40.300.
Scapes, John N.; and Speckmann, Donald R., 4,129,284, Cl. 251-205.000.
Young, John W., 4,129,896, Cl. 361-371.000.

Gould, William, to Nyltite Corporation. Screw head cover. 4,129,060, Cl. 85-53.000.

Graham, John P. Chain and tightening binder assembly. 4,129,285, Cl. 254-78.000.

Grange, Arthur; and Booth, Stuart E., to Ultrasonics, Ltd. Apparatus for the homogenization of liquids. 4,129,387, Cl. 366-119.000.

Graphic Controls Corporation: *See—*
Hubbard, James R., 4,129,876, Cl. 346-140.00A.

Graves, Daniel F.: *See—*
Fieldhouse, John W.; Graves, Daniel F.; Cole, William M.; Stayer, Mark L.; and Fenske, Steven L., 4,129,529, Cl. 528-168.000.

Gray, Paul R.; McCreary, James L.; and Hodges, David A., to University of California, Regents of the. Weighted capacitor analog/digital converting apparatus and method. 4,129,863, Cl. 340-347.0AD.

Greed, Robert B.: *See—*
Wallington, John R.; and Greed, Robert B., 4,129,838, Cl. 333-7.00D.

Green, Philip S., to SRI International. Phase reversal ultrasonic zone plate transducer. 4,129,799, Cl. 310-359.000.

Greenaway, David L., to Landis & Gyr. Method and apparatus for storing and reading authenticating information. 4,129,382, Cl. 356-71.000.

Greenberg, Ronald C., to t.h.e. Original Mirror Company. Decorative mirrored article with bevel-effect producing edges. 4,129,671, Cl. 428-48.000.

Greene, Clarence K. Momentary torque maximizing method and apparatus. 4,129,005, Cl. 60-715.000.

Greenfield, Stanley A.; and Dupont, John A., to Rohm and Haas Company. Formaldehyde stabilized coating compositions. 4,129,448, Cl. 106-15.00R.

Greer, James E., to Burlington Industries, Inc. Lab sample jet dyeing machine. 4,129,017, Cl. 68-15.000.

Grey, James S.: *See—*
Hodgson, David A.; and Grey, James S., 4,129,311, Cl. 280-11.37E.

Griep, Peter: *See—*
Golls, John W.; and Griep, Peter, 4,129,407, Cl. 425-87.000.

Griffin, Timothy L., Jr., to Amanita Sound, Inc. Shock resistant loudspeaker enclosure. 4,129,752, Cl. 179-146.00E.

Griffin, Warren H.: *See—*
Park, Chung P.; Corbett, John M.; and Griffin, Warren H., 4,129,530, Cl. 521-79.000.

Grinder, Charles E. Golfer's aid. 4,129,237, Cl. 224-5.00C.

Grob, Russel W.: *See—*
Niles, Albert B.; Franzen, Larry H.; Gardner, William J.; and Grob, Russel W., 4,129,034, Cl. 73-117.300.

Grote, Reinhard: *See—*
Fakla, Istvan E.; and Grote, Reinhard, 4,129,539, Cl. 260-27.00R.

Grumman Aerospace Corporation: *See—*
Leftheris, Basil P.; Mainhardt, Joseph H.; and Schwenk, Walter, 4,129,028, Cl. 72-430.000.

Grundamann, Raban: *See—*
Rueter, Joern; and Grundamann, Raban, 4,129,551, Cl. 260-45.70R.

Gruppo Lepetit S.p.A.: *See—*
Cricchio, Renato, 4,129,562, Cl. 260-239.30P.

GTE Sylvania Incorporated: *See—*
Fohl, Timothy, 4,129,380, Cl. 355-113.000.
Karlotski, Robert J., 4,129,348, Cl. 316-20.000.

Guelfo, Roberto: *See—*
Rattin, Luciano; and Guelfo, Roberto, 4,129,378, Cl. 355-14.000.

Guenzel, William C.: *See—*
Theurer, John; Guenzel, William C.; and Beck, Orville F., 4,129,395, Cl. 403-317.000.

Guglielmo, Richard J., Sr. Primer composition, process for using same and product obtained thereby. 4,129,676, Cl. 428-315.000.

Guidotti, Vincenzo: *See—*
Credali, Lino; Baruzzi, Giovanni; and Guidotti, Vincenzo, 4,129,559, Cl. 528-337.000.

Guild International, Inc.: *See—*
Morris, Terrence P., 4,129,244, Cl. 228-170.000.

Gumbinner, Robert: *See—*
Deutsch, Albert A.; Dennis, Richard; and Gumbinner, Robert, 4,129,486, Cl. 204-159.190.

Gunther, Dieter; Schinzel, Erich; Erckel, Rudiger; and Rosch, Gunter, to Hoechst Aktiengesellschaft. Brightener mixtures and their use. 4,129,412, Cl. 8-1.00W.

Gurney, John A.: *See—*
Gander, Robert J.; and Gurney, John A., 4,129,662, Cl. 424-305.000.

Guzay, Casimir M.: *See—*
Bulanda, John J.; Guzay, Casimir M.; and Betitschke, Bruce A., 4,128,919, Cl. 24-20.01TT.

Gym-Kin Inc.: *See—*
Siebert, Gary R., 4,128,902, Cl. 2-2.000.

Gyromat Corporation: *See—*
Wiggins, Richard F., 4,129,092, Cl. 118-323.000.

H.B. Fuller Company: *See—*
Juba, Bernard T., 4,128,981, Cl. 52-309.300.

Haas, Edwin J. Manually actuated spray head with comfort hold and actuator. 4,129,235, Cl. 222-321.000.

Haberlein, Harald; Nies, Herbert; and Scheidl, Franz, to Hoechst Aktiengesellschaft. Organic phosphites and their use as stabilizers. 4,129,553, Cl. 260-45.85R.

Habu, Nobuo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine with an auxiliary chamber. 4,129,100, Cl. 123-32.00L.

Haferl, Peter E., to RCA Corporation. Correction circuit for load dependent raster distortion. 4,129,806, Cl. 315-370.000.

Halasa, Adel F.: *See—*
Adams, Harold E.; Boutsicaris, Stephen P.; and Halasa, Adel F., 4,129,699, Cl. 526-42.000.

Hale Fire Pump Company: *See—*
Eberhardt, Harry A., 4,129,402, Cl. 415-53.00R.

Hall, John B.: *See—*
Schreiber, William L.; Siano, James N.; and Hall, John B., 4,129,569, Cl. 260-307.0FA.

Hallgren, John E., to General Electric Company. Method for making cyclic carbonates and polymers therefrom. 4,129,574, Cl. 260-340.200.

Halm, Hans, to Confon AG, Firma. Data register. 4,129,215, Cl. 209-610.000.

Hamada, Nagaharu: *See—*
Iwamura, Masahiro; Hamada, Nagaharu; Hara, Toshitaka; and Sato, Nobuo, 4,129,859, Cl. 340-324.0AD.

Hamilton, Brian K.: *See—*
Garner, Eugene F.; and Hamilton, Brian K., 4,128,996, Cl. 60-205.000.

Hammar, John R., to Aktiebolaget Electrolux. Gas burner lighting device for an absorption refrigerating apparatus. 4,129,408, Cl. 431-251.000.

Hammond, Howard A.; and Sardina, John F., to Eaton Corporation. Hold-down device for storage batteries. 4,129,194, Cl. 180-68.500.

Hannes, George J.; Rohweder, Theodore R.; Dreikorn, Hans W.; and Shepherd, Philip B., to Johns-Manville Corporation. Fibrous mat especially suitable for roofing products and a method of making the mat. 4,129,674, Cl. 428-285.000.

Hanson, Gordon L.: *See—*
Heyn, Fred M.; Yin, Ching-Feng; Hanson, Gordon L.; and Schreck, Robert C., 4,129,176, Cl. 165-7.000.

Happel, Hermann E.; and Anthony, James R., to Indiana Mills & Manufacturing Inc. Laminated seat belt buckle. 4,128,924, Cl. 24-230.0AL.

Hara, Masahiro: *See—*
Horiuchi, Kaoru; Matsui, Akio; Hara, Masahiro; and Takahashi, Hiroshi, 4,129,442, Cl. 75-126.00C.

Hara, Toshifumi: *See—*
Kurita, Tetsuya; and Hara, Toshifumi, 4,129,137, Cl. 134-144.000.

Hara, Toshitaka, to Hitachi, Ltd. Partitioned display control system. 4,129,858, Cl. 340-324.0AD.

Hara, Toshitaka: *See—*
Iwamura, Masahiro; Hamada, Nagaharu; Hara, Toshitaka; and Sato, Nobuo, 4,129,859, Cl. 340-324.0AD.

Hardinge Brothers, Inc.: *See—*
Peterson, Anders A.; and Catlin, Francis D., 4,129,220, Cl. 214-1.400.

Hargassner, Reinhard: *See—*
Holleis, Gunter; and Hargassner, Reinhard, 4,129,174, Cl. 164-443.000.
Scheurecker, Werner; and Hargassner, Reinhard, 4,129,173, Cl. 164-442.000.

Harpell, Gary A.: *See—*
Kamath, Vasanth R.; and Harpell, Gary A., 4,129,703, Cl. 526-73.000.

Harper, Bruce M.: *See—*
Billett, Ronald J.; and Harper, Bruce M., 4,129,230, Cl. 221-268.000.

Harris Corporation: *See—*
Neal, Gary W.; and Montgomery, Robert M., 4,129,832, Cl. 331-44.000.
Schriber, Louis; and Stephens, Robert E., 4,129,293, Cl. 270-52.000.

Harris, James L., to R. J. Reynolds Tobacco Company. Apparatus for contacting an aerosol stream with a liquid. 4,129,427, Cl. 55-247.000.

Harrison, Robert S.: *See—*
Rogerson, Jerry B.; and Harrison, Robert S., 4,129,623, Cl. 261-52.000.

Harshberger, Robert P., Jr., to Ampex Corporation. Switching motor control system. 4,129,810, Cl. 318-317.000.

Hart, Harry L.: *See—*
Beaver, Millard B.; Johnson, Leonard L.; Hart, Harry L.; and Mahoney, Tennis, 4,129,074, Cl. 101-35.000.

Hartemann, Pierre, to Thomson-CSF. Elastic surface wave oscillator. 4,129,837, Cl. 331-107.00A.

Hartmann, Otto: *See—*
Korner, Wolf-Dietrich; and Hartmann, Otto, 4,129,404, Cl. 417-364.000.

Harvester Center Italiana S.r.l.: *See—*
Santarelli, Mario, 4,128,986, Cl. 56-328.0TS.

Harvey, Lawrence, to British Petroleum Company Limited, The. Solar energy collector. 4,129,117, Cl. 126-271.000.

Hashizume, Akihide: *See—*
Suzuki, Ryuichi; Hashizume, Akihide; Horiuchi, Hideyuki; Yamamoto, Shinji; and Yokouchi, Hisatake, 4,129,854, Cl. 340-146.3CA.

Hasquenoph, Jean H.; and Coutin, Pierre F., to R. Alkan & Cie. Automatic hanging and wedging device for aircraft loads. 4,129,271, Cl. 244-137.00R.

Hasselbacher, Roland E., to Caterpillar Tractor Co. Fire suppression system. 4,129,185, Cl. 169-62.000.

Hatch, Edmond K., to Osborn Manufacturing Company, The. Horizontal stack molding machine and method. 4,129,208, Cl. 198-626.000.

Hattori, Tadashi; Nakase, Takamichi; Tsubouchi, Hideo; and Iwata, Toshiharu, to Nippon Soken, Inc. Overheat preventing system for exhaust gas purifier of vehicles. 4,128,998, Cl. 60-277.000.

Haws Corporation, The: *See—*
Johnson, Bernard L., 4,129,163, Cl. 160-135.000.

Hay, Louis E.: *See—*
Friz, Walter, 4,129,803, Cl. 315-3.500.

Hayden, Joseph C., Jr. Engine overspeed control system. 4,129,040, Cl. 73-507.000.

Hayes, James C.: *See—*
Gilano, Michael N.; and Hayes, James C., 4,129,758, Cl. 200-5.00A.

Hayes, William V.: *See—*
Childress, David L.; Hayes, William V.; and Poppe, Richard L., 4,129,600, Cl. 260-604.00R.

Haynes, Edward M. Method and apparatus for detecting water in oil. 4,129,501, Cl. 210-23.00R.

Hedgcock, Richard L., to Caterpillar Tractor Co. Spring operated clutch with small and large bolts. 4,129,204, Cl. 192-89.00B.

Heiliger, Leonard R.: *See—*
Wakeman, Alden H.; and Heiliger, Leonard R., 4,129,389, Cl. 366-144.000.

Heinz, Lothar: *See—*
Tschunt, Edgar; Platz, Winfried; Bar, Ulrich; and Heinz, Lothar, 4,129,784, Cl. 250-505.000.

Heinze, Horst; Stierle, Gunter; and Sach, Ernst D., to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Tension strap with movable tension blocks. 4,128,921, Cl. 24-279.000.

Heiss, Herbert L., to Mobay Chemical Corporation. Thermoplastic polyurethanes of mixtures of hard and soft thermoplast polymers. 4,129,611, Cl. 260-858.000.

Helena Rubinstein, Inc.: *See—*
Barnett, Gabriel; Gershaw, Nathan; and Mausner, Jack J., 4,129,645, Cl. 424-60.000.

Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA): *See—*
Rose, David; Weinrich, Erwin; and Lieske, Edgar, 4,129,413, Cl. 8-10.200.
Rose, David; Saygin, Ferdi; and Lieske, Edgar, 4,129,414, Cl. 8-10.200.

Henri Muhlethaler S.A.: *See—*
Muhlethaler, Henri, 4,128,943, Cl. 33-174.00Q.

Henrikssen, Ole: *See—*
Marsh, Gunnar; Henrikssen, Ole; and Sjoblum, Urban C. S., 4,128,903, Cl. 3-19.000.

Henson, F. Gene. Cap for releasably covering well casings. 4,129,151, Cl. 138-89.000.

Henson, Kenneth, to Unigate Limited. Electro-chemical cells. 4,129,689, Cl. 429-101.000.

Hercules Incorporated: *See—*
Jamison, Joel D.; Towle, Gordon A.; and Vermeychuk, J. Gregory, 4,129,663, Cl. 426-602.000.

Herd, Josef, to Maschinenfabrik GOEBEL GmbH. Apparatus for feeding a web in registry between web passes through a processing machine. 4,129,238, Cl. 226-29.000.

Hergenrother, William L.: *See—*
Kang, Jung W.; and Hergenrother, William L., 4,129,579, Cl. 260-346.110.

Herklotz, Gunther; and Reichelt, Walter, to W. C. Heraeus GmbH. Electrical switching contact. 4,129,765, Cl. 200-268.000.

Hermann, William J., Jr., to Dickson, Jocelyn, a part interest. Disposable laboratory device for transfer of fluids to a centrifugal analyzer head. 4,129,419, Cl. 422-64.000.

Hern, John F.; and Buccellato, Joseph L., to Massey-Ferguson Inc. Door latch. 4,129,325, Cl. 292-127.000.

Hettche, Albert: *See—*
Patsch, Manfred; and Hettche, Albert, 4,129,563, Cl. 260-239.900.

Heuser, Jurgen: *See—*
Serini, Volker; Friedhofen, Gerhard; Frietag, Dieter; and Heuser, Jurgen, 4,129,612, Cl. 260-860.000.

Hewlett-Packard Company: *See—*
Dias, J. Fleming; Karrer, Henry E.; and Tykulsky, Alexander, 4,129,242, Cl. 228-121.000.

Heyn, Fred M.; Yin, Ching-Feng; Hanson, Gordon L.; and Schreck, Robert C., to Thermal Transfer, division of Kleinewefers. Heat recovery systems. 4,129,176, Cl. 165-7.000.

Hi-Tech Industries, Inc.: *See—*
Kaplan, Neil, 4,129,543, Cl. 260-29.15B.

Hidalgo, Jaime: *See—*
Kruseman, Jan; Bertschy, Pierre Y.; and Hidalgo, Jaime, 4,129,664, Cl. 426-7.000.

Higelin, Jean-Claude: *See—*
Racine, Philippe; Higelin, Jean-Claude; Engelhardt, Roland; and Mindt, Wolfgang, 4,129,478, Cl. 204-1.00T.

Higgens, Calvin E.: *See—*
Michel, Karl H.; and Higgens, Calvin E., 4,129,721, Cl. 536-17.000.

Hildebrand, Helmut; and Dunker, Gerhard, to Kabel-und Metallwerke Gutehoffnungshutte A.G. Radiating cable having spaced radiating sleeves. 4,129,841, Cl. 333-84.00L.

Hill, Donald R. Kite control mechanism. 4,129,273, Cl. 244-155.00A.

Hilz, Lloyd A.: *See—*
Demers, Arthur S.; and Hilz, Lloyd A., 4,129,011, Cl. 405-169.000.

Hind, John D.; and Hopkins, William C., to Philip Morris Incorporated. Smoking article. 4,129,134, Cl. 131-2.000.

Hine, Louis P., Jr., to Westinghouse Electric Corp. Air-conditioning unit with multi-position coil. 4,129,013, Cl. 62-285.000.

Hirose, Shintaro: *See—*
Ishii, Yasuhiro; Hirose, Shintaro; and Kawasaki, Ryoichi, 4,129,195, Cl. 181-167.000.

Hirt, Manfred: *See—*
Eichinger, Johann; and Hirt, Manfred, 4,129,394, Cl. 403-57.000.

Hiser, William H., to Lighthouse Fireplaces, Inc. Fireplace-furnace system. 4,129,114, Cl. 126-122.000.

Hitachi Cable, Ltd.: *See—*
Seki, Masatoshi; Sato, Moriichi; Tsukioka, Hideo; Ohe, Etuo; Ogata, Masatsugu; and Mitsuoka, Akio, 4,129,678, Cl. 428-383.000.

Hitachi Chemical Co., Ltd.: *See—*
Karasawa, Yoshiharu; Koyama, Tohru; and Narahara, Toshikazu, 4,129,554, Cl. 528-48.000.
Kobayashi, Kengo; Mogami, Masayuki; Tanaka, Shigeyoshi; Nakao, Manabu; and Tamura, Sadao, 4,129,610, Cl. 260-837.00R.

Hitachi Heating Appliances Co., Ltd.: *See—*
Inano, Tozaburo; Yamazaki, Katsuhiro; and Otake, Minoru, 4,129,774, Cl. 219-552.000.

Hitachi, Ltd.: *See—*
Goto, Masuo; Isono, Akira; Momochi, Yasushi; and Kai, Takaaki, 4,129,818, Cl. 322-10.000.
Hara, Toshitaka, 4,129,858, Cl. 340-324.0AD.
Hosaka, Nobuyoshi; Ishikawa, Yuichi; Nishida, Osamu; and Sakamoto, Masakatsu, 4,129,337, Cl. 302-2.00R.
Inaniwa, Keizo; and Ryugo, Noboru, 4,129,090, Cl. 118-49.000.
Ito, Syoichi; and Yamada, Takahiro, 4,129,875, Cl. 346-75.000.
Iwamura, Masahiro; Hamada, Nagaharu; Hara, Toshitaka; and Sato, Nobuo, 4,129,859, Cl. 340-324.0AD.

Karasawa, Yoshiharu; Koyama, Tohru; and Narahara, Toshikazu, 4,129,554, Cl. 528-48.000.
Kato, Shigeo; Morita, Osamu; and Matuoka, Sadao, 4,129,291, Cl. 269-73.000.
Kawakami, Kazuhiko, 4,129,104, Cl. 123-117.00A.
Masuda, Ikuro, 4,129,901, Cl. 364-104.000.
Seki, Masatoshi; Sato, Moriichi; Tsukioka, Hideo; Ohe, Etuo; Ogata, Masatsugu; and Mitsuoka, Akio, 4,129,678, Cl. 428-383.000.
Soeno, Ko; Iizuka, Tomio; Doi, Toshio; Ando, Hisashi; Oyama, Testuo; Sakamoto, Hiroshi; and Misumi, Akira, 4,129,801, Cl. 313-346.00R.
Suzuki, Ryuichi; Hashizume, Akihide; Horiuchi, Hideyuki; Yamamoto, Shinji; and Yokouchi, Hisatake, 4,129,854, Cl. 340-146.3CA.
Yotsukura, Teruo, 4,129,376, Cl. 355-11.000.

Hitesman, Roderick H.: *See*—
Kunda, Wasyl; and Hitesman, Roderick H., 4,129,441, Cl. 75-118.00R.

Hobes, John; and Payer, Wolfgang, to Ruhrchemie Aktiengesellschaft. Composition and use of ethylene copolymerizates as fusible adhesive. 4,129,472, Cl. 156-331.000.

Hobo, Nobuhito: *See*—
Ito, Osamu; Hobo, Nobuhito; Suzuki, Yutaka; Kawamoto, Itsushi; Naitou, Takashi; Shiozaki, Makoto; and Konishi, Yoshimune, 4,129,105, Cl. 123-119.0EC.

Hochon, Bernard: *See*—
Galaj, Stanislas; Hochon, Bernard; and Lerner, Pierre, 4,129,552, Cl. 260-45.9QB.

Hodge, Frank G.: *See*—
Matthews, Steven J.; Klein, H. Joseph; and Hodge, Frank G., 4,129,464, Cl. 148-162.000.

Hodges, David A.: *See*—
Gray, Paul R.; McCreary, James L.; and Hodges, David A., 4,129,863, Cl. 340-347.0AD.

Hodgson, David A.; and Grey, James S., to International Power Pole, Ltd. Illuminated ski pole. 4,129,311, Cl. 280-11.37E.

Hoechst Aktiengesellschaft: *See*—
Gordon, Wolfgang, 4,129,629, Cl. 264-13.000.
Gunther, Dieter; Schinzel, Erich; Erckel, Rudiger; and Rosch, Gunter, 4,129,412, Cl. 8-1.00W.
Haberlein, Harald; Nies, Herbert; and Scheidl, Franz, 4,129,553, Cl. 260-45.85R.
Lang, Hans-Jochen; and Muschaweck, Roman, 4,129,656, Cl. 424-263.000.
Wallhausser, Karl H.; Cuntze, Ulrich; May, Adolf; and Bucking, Hans-Walter, 4,129,506, Cl. 252-8.800.
Zoltobrocki, Manfred, 4,129,560, Cl. 260-112.00R.

Hoehn, Hans, to E. R. Squibb & Sons, Inc. 5-Phenylpyrazolo[1,5-a]pyrimidin-7(1H)-ones. 4,129,738, Cl. 544-281.000.

Hoeholt, Steffen, to Dehn Holding A/S. Chair made of two plate-like elements. 4,129,332, Cl. 297-440.000.

Hofelt, Clarence, Jr.: *See*—
Gormish, Kenneth J.; and Hofelt, Clarence, Jr., 4,128,969, Cl. 51-106.00R.

Hoffmann-La Roche Inc.: *See*—
Racine, Philippe; Higelin, Jean-Claude; Engelhardt, Roland; and Mindt, Wolfgang, 4,129,478, Cl. 204-1.00T.
Westley, John, 4,129,580, Cl. 260-347.700.

Hoffmann, Rudiger, to Daimler-Benz Aktiengesellschaft. Check valve, especially for vacuum-operated installations in motor vehicles. 4,129,143, Cl. 137-496.000.

Hoffstadt, Walter F.: *See*—
Tracy, David J.; and Hoffstadt, Walter F., 4,129,739, Cl. 560-21.000.

Hofman, Bernard L. Paint and tool case. 4,129,346, Cl. 312-324.000.

Hofmann, Harald: *See*—
Rauer, Kurt; Hofmann, Harald; Schiller, Heidelinde; and Sheppard, Chester S., 4,129,531, Cl. 521-94.000.

Hollandsche Beton Groep N.V.: *See*—
Jansz, Joost W., 4,129,009, Cl. 405-227.000.

Holleis, Gunter; and Hargassner, Reinhard, to Vereinigte Osterreichische Eisen-und Stahlwerke - Alpine Montan Aktiengesellschaft. Arrangement for adjusting and securing a bottomless mould. 4,129,174, Cl. 164-443.000.

Holsapple, Earle T., III. Sheathed razor blade. 4,128,941, Cl. 30-151.000.

Holtvoigt, Werner: *See*—
Praetorius, Heinz; Seibert, Karl; and Holtvoigt, Werner, 4,129,717, Cl. 528-421.000.

Homsy, Charles A. Method of preparing a porous implantable material from polytetrafluoroethylene and carbon fibers. 4,129,470, Cl. 156-155.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Sato, Makoto; Takamatsu, Hiroshi; Miyagawa, Yoshitaka; and Fujii, Etsuo, 4,129,342, Cl. 303-105.000.

Hooker Chemicals & Plastics Corp.: *See*—
Sendlak, Lawrence P., 4,129,602, Cl. 260-651.00F.

Hopkins, Jack M. Carrier and storage binder for fabric samples. 4,129,212, Cl. 206-450.000.

Hopkins, William C.: *See*—
Hind, John D.; and Hopkins, William C., 4,129,134, Cl. 131-2.000.

Hori, Tatsu; Gardiner, Kenneth W.; and Mangal, Norman F., to Savin Business Machines Corporation. Semiautomatic document feeder. 4,129,295, Cl. 271-186.000.

Horiuchi, Hideyuki: *See*—
Suzuki, Ryuichi; Hashizume, Akihide; Horiuchi, Hideyuki; Yamamoto, Shinji; and Yokouchi, Hisatake, 4,129,854, Cl. 340-146.3CA.

Horiuchi, Kaoru; Matsui, Akio; Hara, Masahiro; and Takahashi, Hiroshi, to Kawasaki Jukogyo Kabushiki Kaisha. Wear- and impact-resisting cast steel. 4,129,442, Cl. 75-126.00C.

Hormann, Karl; and Weigand, Hans, to Kugelfischer Georg Schafer & Co. Bearing race ring with lubricant and cooling channels. 4,129,344, Cl. 308-187.000.

Horner, James D.: *See*—
Eliades, Theo I.; Muir, Ronald J.; and Horner, James D., 4,129,589, Cl. 260-504.00A.

Horowitz, Harold S.; Longo, John M.; and Lewandowski, Joseph T., to Exxon Research & Engineering Co. Method of making lead-rich and bismuth-rich pyrochlore compounds using an alkaline medium. 4,129,525, Cl. 252-518.000.

Horton, Phineas E., III: *See*—
Bond, Ronald L.; Daughdrill, E. Chris; Brice, Henry T.; and Horton, Phineas E., III, 4,129,314, Cl. 280-425.00R.

Hosaka, Nobuyoshi; Ishikawa, Yuichi; Nishida, Osamu; and Sakamoto, Masakatsu, to Hitachi, Ltd. Method for preventing erosion-corrosion of hydraulic capsule transportation apparatus. 4,129,337, Cl. 302-2.00R.

Hoshi, Yoshitomo, to Kabushikigaisha Kawaigakkiseisakusho. Keyboard support mechanism for electronic organs. 4,129,057, Cl. 84-434.000.

Hotto, Robert: *See*—
Lester, Robert W.; and Hotto, Robert, 4,129,125, Cl. 128-2.05R.

Houbion, John A., to Monsanto Company. 3-Phenacyl and phenacylidene phthalimidines and corresponding naphthoyl derivatives. 4,129,729, Cl. 542-439.000.

Houston, John M., to General Electric Company. High speed computerized tomography imaging system. 4,129,783, Cl. 250-445.00T.

Howard nee Murtagh, Joan M.: *See*—
Cairns, Roger J. R.; and Howard nee Murtagh, Joan M., 4,129,499, Cl. 210-23.00R.

Howarth, David S., to General Motors Corporation. Galvanic exhaust gas sensor with solid electrolyte. 4,129,099, Cl. 123-32.0EE.

Howe, Robert K., to Monsanto Company. 2-[3-Aryl-2-isoxazolin-5-yl]benzoates. 4,129,568, Cl. 260-307.00F.

Howes, Edward P. Electronic hydrometer. 4,129,824, Cl. 324-29.500.

Hubbard, James R., to Graphic Controls Corporation. Apparatus for mounting a marker pen to a tubular recorder pen arm. 4,129,876, Cl. 346-140.00A.

Hubbard, Leo J., to Precision Handling Devices, Inc. Clamping devices for document tractors. 4,129,239, Cl. 226-75.000.

Huber, Rolf: *See*—
Kiehs, Karl; and Huber, Rolf, 4,129,601, Cl. 568-593.000.

Hucke, Hans. Heat exchange installation for heating and cooling a liquid heat carrier medium. 4,129,178, Cl. 165-61.000.

Hudson Products Corporation: *See*—
Larinoff, Michael W., 4,129,180, Cl. 165-113.000.

Hudson, Thomas H.: *See*—
Wells, William M., 4,129,844, Cl. 335-268.000.

Huebner, Charles F., to Ciba-Geigy Corporation. Neuroleptic 2-piperidinoalkyl-1,4-benzodioxans. 4,129,655, Cl. 424-267.000.

Hug, Alfred J. T. Pressure responsive circuit interrupter. 4,129,759, Cl. 200-83.00R.

Hughes Aircraft Company: *See*—
Bilow, Norman; Landis, Abraham L.; and Miller, Leroy J., 4,129,570, Cl. 528-128.000.
O'Meara, Thomas R., 4,129,775, Cl. 250-203.00R.

Humbert, Kingsley E., Jr.; and Judah, Lewis J., to Wix Corporation. Dual element air filter. 4,129,429, Cl. 55-484.000.

Humphries, Peter E., to Contronic Controls Limited. Filter system and method for intrusion alarm. 4,129,856, Cl. 340-554.000.

Hunter, Alex E. Pole seat and ladder. 4,129,198, Cl. 182-187.000.

Hunter Douglas International N.V.: *See*—
de Wit, Hendrik, 4,128,914, Cl. 16-1.00R.

Hunterdon Transformer Company: *See*—
Brock, Elwood M., 4,129,820, Cl. 323-56.000.

Hunts, Barney D.; and Waugh, John B. S., to Singer Company, The. Method and apparatus for adaptive control of a stepper motor. 4,129,813, Cl. 318-561.000.

Huppert, Karl-Ludwig; and Fang, Dieter, to Gesellschaft zur Wiederaufarbeitung von Kernbrennstoffen mbH. Method for conditioning metallic waste shells made of zirconium or zirconium alloys. 4,129,518, Cl. 252-301.10W.

Husted, Royce H., to Saroy Engineering. Propulsion system for a snow going device. 4,129,193, Cl. 180-5.00R.

Hutchison, Charles L. Sealing device. 4,128,922, Cl. 24-30.50R.

Hutchison, Stanley O., to Chevron Research Company. Packer cup assembly. 4,129,308, Cl. 277-188.00R.

I-T-E Imperial Corporation: *See*—
Keller, Frank R.; Cataldo, John B.; Kussy, Frank W.; and DiMarco, Bernard, 4,129,843, Cl. 335-174.000.

ICI Americas Inc.: *See*—
Ferrarini, James; and Kuehn, Erich, 4,129,641, Cl. 264-294.000.

IDR, Inc.: *See*—
Saylor, Richard, 4,129,748, Cl. 178-69.100.

Ifield Engineering Pty. Limited: *See*—
Ifield, Richard J., 4,129,063, Cl. 91-506.000.

Ifield, Richard J., to Ifield Engineering Pty. Limited. Bent axis pumps and motors. 4,129,063, Cl. 91-506.000.

Ignashev, Evgeny P.; Konovalov, Evmeny G., deceased; by Konova-

lov, Georgy E., administrator; and by Zaitseva, Nina E., administrator. Apparatus for making metal strip. 4,129,027, Cl. 72-429.000.
Iizuka, Akichika, to Iizuka Electric Industry Company Limited. Pin plug. 4,129,352, Cl. 339-177.00R.
Iizuka Electric Industry Company Limited: *See*—
Iizuka, Akichika, 4,129,352, Cl. 339-177.00R.
Iizuka, Tomio: *See*—
Soeno, Ko; Iizuka, Tomio; Doi, Toshio; Ando, Hisashi; Oyama, Testuo; Sakamoto, Hiroshi; and Misumi, Akira, 4,129,801, Cl. 313-346.00R.
Imai, Kiyoshi: *See*—
Kawabe, Hirokazu; Imai, Kiyoshi; and Miyakoshi, Masanobu, 4,128,909, Cl. 15-104.00A.
Imaizumi, Hiroyuki: *See*—
Saikawa, Isamu; Takano, Shuntaro; Imaizumi, Hiroyuki; Takakura, Isamu; Ochiai, Hirokazu; Yasuda, Takashi; Taki, Hideo; Tai, Masaru; and Kodama, Yutaka, 4,129,730, Cl. 544-21.000.
Imanishi, Nobuyuki: *See*—
Taguchi, Kazumasa; Nishida, Tsutomu; Kitajima, Masaharu; Aketa, Kan; Fujita, Isao; Onoda, Mamoru; Imanishi, Nobuyuki; and Watanabe, Ryo, 4,129,437, Cl. 75-5.000.
Imperial Chemical Industries Limited: *See*—
Bell, Stephen L., 4,129,603, Cl. 260-653.000.
Deverell, Christopher; and Wells, Ronald W., 4,129,469, Cl. 156-157.000.
Downer, John M.; Rodway, William G.; and Shipp, Lawrence S. J., 4,129,618, Cl. 260-884.000.
Jennings, James R.; and Sen, Dipankar, 4,129,587, Cl. 260-465.80D.
Roberts, Philip D.; Randall, Geoffrey L. P.; Simon, David G.; and Booth, Jeffrey, 4,129,702, Cl. 526-71.000.
Snowden, Paul, 4,129,523, Cl. 252-475.000.
Thompson, Morice W.; and Topham, Arthur, 4,129,455, Cl. 106-308.00N.
Imperial Metal Industries (Kynoch) Limited: *See*—
Morton, Peter H.; Gilbert, John R. B.; and Wortley, John P. A., 4,129,492, Cl. 204-212.000.
Imura, Toshinori: *See*—
Kobayashi, Haruo; and Imura, Toshinori, 4,129,369, Cl. 354-197.000.
Inaniwa, Keizo; and Ryugo, Noboru, to Hitachi, Ltd. Apparatus for diffusion into semiconductor wafers. 4,129,090, Cl. 118-49.000.
Inano, Tozaburo; Yamazaki, Katsuhiro; and Otake, Minoru, to Hitachi Heating Appliances Co., Ltd. Filling materials for heating elements. 4,129,774, Cl. 219-552.000.
Indiana Mills & Manufacturing Inc.: *See*—
Happel, Hermann E.; and Anthony, James R., 4,128,924, Cl. 24-230.0AL.
Industrie Pirelli Societa per Azioni: *See*—
Portinari, Antonio; and Lavezzari, Piero, 4,129,466, Cl. 156-48.000.
Infante, Carlo, to Xerox Corporation. Current regulating circuit for magnetic deflection systems. 4,129,807, Cl. 315-387.000.
Ing. C. Olivetti & C., S.p.A.: *See*—
Rattin, Luciano; and Guelfo, Roberto, 4,129,378, Cl. 355-14.000.
Inoue, Akira; and Oka, Minori, to Kabushiki Kaisha Daini Seikosha. Method and apparatus for measuring the thickness of a non-metallic coating on a plated metal plate. 4,129,778, Cl. 250-272.000.
Inoue, Sho; Kawamata, Masanobu; Ushimaru, Hirokazu; Nakamichi, Koichi; and Takahashi, Yutaka, to Nippon Shinyaku Co. Ltd. Process for producing easily absorbable amorphous steryl glucoside monopalmitates and preparations thereof. 4,129,649, Cl. 424-182.000.
INTERATOM, International Atomreaktorbau GmbH: *See*—
Podgorski, Jan, 4,129,851, Cl. 340-11.000.
Interbrev S. A.: *See*—
Taccani, Riccardo, 4,129,639, Cl. 264-157.000.
International Business Machines Corporation: *See*—
Althauser, William E.; and Barnes, Richard A., 4,129,853, Cl. 340-146.3AG.
Basi, Jagtar S., 4,129,457, Cl. 134-2.000.
Bula, John; and Martin, Larry C., 4,129,793, Cl. 307-270.000.
Gani, Venkappa L.; and Montegari, Frank A., 4,129,790, Cl. 307-203.000.
International Business Machines Incorporated: *See*—
Vinal, Albert W., 4,129,880, Cl. 357-27.000.
International Dynetics Corporation: *See*—
Longo, Joseph F., 4,129,329, Cl. 294-70.000.
International Flavors & Fragrances Inc.: *See*—
Schreiber, William L.; Siano, James N.; and Hall, John B., 4,129,569, Cl. 260-307.0FA.
International Harvester Company: *See*—
Duke, Edward D.; and Riordan, Joan M., 4,128,952, Cl. 37-8.000.
Lech, Richard J., 4,129,148, Cl. 137-596.000.
International Power Pole, Ltd.: *See*—
Hodgson, David A.; and Grey, James S., 4,129,311, Cl. 280-11.37E.
International Power Technology, Inc.: *See*—
Cheng, Dah Y., 4,128,994, Cl. 60-39.050.
Iovine, Carmine P.; and Ray-Chaudhuri, Dilip K., to National Starch and Chemical Corporation. Process for the preparation of high D. S. polysaccharides. 4,129,722, Cl. 536-43.000.
Irick, Gether, Jr.; Kelly, Charles A.; and Martin, James C., to Eastman Kodak Company. Bichromophoric benzoxazole-styrene ester and amide ultraviolet stabilizers and their use in organic compositions. 4,129,723, Cl. 542-416.000.
Irnich, Werner; and de Bakker, Jacques. Interference-detecting demand heart pacemaker. 4,129,133, Cl. 128-419.0PG.
Ishida, Masato: *See*—
Miyamoto, Koichi; Tohyama, Yoshikuni; Sagara, Seiji; Kimura, Yoshimasa; and Ishida, Masato, 4,129,377, Cl. 355-14.000.
Ishiguro, Yasuo; and Wakazono, Kenji, to Copal Company Limited. Controlling circuit for electric shutters. 4,129,370, Cl. 354-234.000.
Ishii, Yasuhiro; Hirose, Shintaro; and Kawasaki, Ryoichi, to Sanyo Electric Co., Ltd.; and Tokyo Sanyo Electric Co., Ltd. Diaphragm for speaker. 4,129,195, Cl. 181-167.000.
Ishikawa, Yoshikazu, to Nissan Motor Company, Limited. Accessory drive. 4,129,043, Cl. 74-219.000.
Ishikawa, Yuichi: *See*—
Hosaka, Nobuyoshi; Ishikawa, Yuichi; Nishida, Osamu; and Sakamoto, Masakatsu, 4,129,337, Cl. 302-2.00R.
Ishimoto, Kameki: *See*—
Sugimoto, Kazuyasu; Yamaya, Hiroshi; and Ishimoto, Kameki, 4,129,351, Cl. 339-176.0MP.
Isobe, Toshiaki: *See*—
Shigenobu, Hiromichi; Isobe, Toshiaki; and Kondo, Minoru, 4,129,812, Cl. 318-484.000.
Isono, Akira: *See*—
Goto, Masuo; Isono, Akira; Momochi, Yasushi; and Kai, Takaaki, 4,129,818, Cl. 322-10.000.
Issenmann, Edouard M. J. A. I.: *See*—
Depouilly, Bernard M. H.; and Issenmann, Edouard M. J. A. I., 4,129,756, Cl. 179-175.20R.
Ito, Hiroshi: *See*—
Shindo, Yoshio; and Ito, Hiroshi, 4,129,051, Cl. 74-867.000.
Ito, Osamu; Hobo, Nobuhito; Suzuki, Yutaka; Kawamoto, Itsushi; Naitou, Takashi; Shiozaki, Makoto; and Konishi, Yoshimune, to Nippondenso Co., Ltd. Air-to-fuel ratio control system for internal combustion engines. 4,129,105, Cl. 123-119.0EC.
Ito, Ryuji: *See*—
Umeda, Haruhiko; Ito, Ryuji; Yokoyama, Akinori; and Komatsu, Mitsuaki, 4,129,000, Cl. 60-361.000.
Ito, Sukemitsu: *See*—
Shikata, Nobuo; and Ito, Sukemitsu, 4,129,485, Cl. 204-144.500.
Ito, Syoichi; and Yamada, Takahiro, to Hitachi, Ltd. Phase control for ink jet printer. 4,129,875, Cl. 346-75.000.
ITW Fastex Italia, Sp.A: *See*—
Sciolotto, Alessandro, 4,129,157, Cl. 140-123.600.
Iura, Yukio: *See*—
Yamamichi, Masayoshi; Iura, Yukio; Tezuka, Nobuo; Watanabe, Satoshi; Uchidoi, Masanori; and Aizawa, Hiroshi, 4,129,877, Cl. 354-271.000.
Iwamura, Masahiro; Hamada, Nagaharu; Hara, Toshitaka; and Sato, Nobuo, to Hitachi, Ltd. Raster scan type CRT display system having an image rolling function. 4,129,859, Cl. 340-324.0AD.
Iwasaki, Koji: *See*—
Gerstine, Milton I.; Goldberg, Joshua I.; Futatsugi, Setsuo; Ueda, Kazuo; Seo, Ryozo; Iwasaki, Koji; and Uemura, Makoto, 4,129,275, Cl. 244-181.000.
Iwasaki, Sadayoshi: *See*—
Miyata, Hiroyasu; and Iwasaki, Sadayoshi, 4,129,766, Cl. 200-308.000.
Iwata, Toshiharu: *See*—
Hattori, Tadashi; Nakase, Takamichi; Tsubouchi, Hideo; and Iwata, Toshiharu, 4,128,998, Cl. 60-277.000.
Jackson, Harry C. Process and apparatus for drying textile stock and the like. 4,128,947, Cl. 34-12.000.
Jacquet, Bernard: *See*—
Kalopissis, Gregoire; Jacquet, Bernard; and Lang, Gerard, 4,129,644, Cl. 424-59.000.
Jaeger, Raymond E.; and Presby, Herman M., to Bell Telephone Laboratories, Incorporated. Fabrication of an optical fiber waveguide with periodic variations in diameter. 4,129,433, Cl. 65-2.000.
James, Stanley L.: *See*—
Bowerman, William J.; James, Stanley L.; and Vixie, Dennis E., 4,128,950, Cl. 36-30.00R.
Jamison, Joel D.; Towle, Gordon A.; and Vermeychuk, J. Gregory, to Hercules Incorporated. Pourable salad dressing composition. 4,129,663, Cl. 426-602.000.
Janowski, Kenneth R.; Shum, Ming S.; and Bradley, Steven A., to UOP Inc. Heat transfer surface. 4,129,181, Cl. 165-133.000.
Janssen, Pierre A., to Nadella. Unitary self-aligning bearing assembly. 4,129,343, Cl. 308-35.000.
Jansz, Joost W., to Hollandsche Beton Groep N.V. Anchoring construction on the sea bottom. 4,129,009, Cl. 405-227.000.
Japan Atomic Energy Research Institute: *See*—
Kinbara, Setsuro, 4,129,830, Cl. 324-186.000.
Machi, Sueo; Matsui, Yasushi; Sugishita, Akio; Sugo, Takanobu; Taniguchi, Hiroaki; Asano, Koichi; and Fujiwara, Hiroshi, 4,129,617, Cl. 260-879.000.
Makuuchi, Keizo; Araki, Kunio; Takagi, Tohru; Nakayama, Hiroyuki; and Kozu, Haruo, 4,129,487, Cl. 204-159.140.
Jeddeloh Bros. Sweed Mills, Inc.: *See*—
Larson, Charles L., 4,129,231, Cl. 222-145.000.
Jefferson, Mark T.: *See*—
Celmer, Walter D.; Cullen, Walter P.; Jefferson, Mark T.; Moppett, Charles E.; Routien, John B.; and Sciavolino, Frank C., 4,129,578, Cl. 260-345.70R.
Jeffreys, Godfrey V.; Mumford, Clive J.; Ravault, Frank E. G.; and Washbourne, Colin, to Foseco International Limited. Treatment of droplet dispersions. 4,129,500, Cl. 210-23.00R.
Jennings, James R.; and Sen, Dipankar, to Imperial Chemical Industries Limited. Dimerization process. 4,129,587, Cl. 260-465.80D.

Jensen, Richard W.; and Peterson, Richard H. Pedal control circuits for electronic piano. 4,129,056, Cl. 84-1.260.

Jezl, James L.; and Peters, Edwin F., to Standard Oil Company (Indiana). Horizontal reactor for the vapor phase polymerization of monomers. 4,129,701, Cl. 526-65.000.

Jin, Jung I., to Stauffer Chemical Company. Fire retardant copolymer of triallyl phosphate and a bis (hydrocarbyl) vinylphosphonate. 4,129,710, Cl. 526-278.000.

Jindrick, James A., to Snap-On Tools Corporation. Oscilloscope pretrigger circuit. 4,129,828, Cl. 324-16.00S.

Johannesen, Donald D., to Bendix Corporation, The. Disc brake and mounting therefor. 4,129,200, Cl. 188-71.100.

Johansson, Eric B.; Klahn, Dale H.; and Marlowe, Mickey O., to General Electric Company. Axially alignable nuclear fuel pellets. 4,129,477, Cl. 176-73.000.

Johns-Manville Corporation: *See*—
Hannes, George J.; Rohweder, Theodore R.; Dreikorn, Hans W.; and Shepherd, Philip B., 4,129,674, Cl. 428-285.000.

Johns, McKinley R., to RCA Corporation. Circularly polarized antenna using slotted cylinder and conductive rods. 4,129,871, Cl. 343-727.000.

Johnsen & Jorgensen (Plastics) Ltd.: *See*—
Percival, Stephen J., 4,129,226, Cl. 215-235.000.

Johnson, Arthur D.: *See*—
Pierce, William C.; Berry, Samuel M.; and Johnson, Arthur D., 4,129,026, Cl. 72-367.000.

Johnson, Bernard L., to Haws Corporation, The. Panel assembly and components thereof. 4,129,163, Cl. 160-135.000.

Johnson, Bruce K.: *See*—
Whiteside, George D.; and Johnson, Bruce K., 4,129,368, Cl. 354-128.000.

Johnson, Duane M.; and Webster, Henry A., III, to United States of America, Navy. Smoke-generating composition. 4,129,465, Cl. 149-19.300.

Johnson & Johnson: *See*—
Butterworth, George A. M.; Elias, Robert T.; and Miller, Wayne D., 4,129,132, Cl. 128-287.000.
Gander, Robert J.; and Gurney, John A., 4,129,662, Cl. 424-305.000.

Johnson, Leighton C., to Miles Laboratories, Inc. Staining apparatus. 4,129,093, Cl. 118-401.000.

Johnson, Leonard L.: *See*—
Beaver, Millard B.; Johnson, Leonard L.; Hart, Harry L.; and Mahoney, Tennis, 4,129,074, Cl. 101-35.000.

Johnson, Marvin M.: *See*—
Tabler, Donald C.; and Johnson, Marvin M., 4,129,605, Cl. 260-669.00A.

Johnson, Robert C.: *See*—
Clark, Frederick P.; Johnson, Robert C.; and Topolewski, John, 4,129,527, Cl. 252-547.000.

Jones, Andrew W.; and Merry, Raymond. Aerofoil structure. 4,129,272, Cl. 244-153.00R.

Jones, Earl O., Jr. Tube coupling. 4,129,324, Cl. 285-107.000.

Jones, Ivor W.; Robinson, Graham; and Bird, Thomas L., to Electricity Council, The. Sodium sulphur cells. 4,129,690, Cl. 429-104.000.

Jones, Keith W.: *See*—
Jones, Wilfred; Jones, Keith W.; and Sweatman, Travers F., 4,129,621, Cl. 261-39.00R.

Jones, Robert A., to Perkin-Elmer Corporation, The. Optical surface polisher. 4,128,968, Cl. 51-54.000.

Jones, Trevor O.: *See*—
Yew, Ming-Chih; and Jones, Trevor O., 4,129,817, Cl. 320-18.000.

Jones, Wilfred; Jones, Keith W.; and Sweatman, Travers F., to Cyprane North America, Inc. Volatile anesthetic vaporizing apparatus. 4,129,621, Cl. 261-39.00R.

Joseph, A. David, to Sealed Power Corporation. Oil pump inlet screen assembly. 4,129,503, Cl. 210-232.000.

Juba, Bernard T., to H.B. Fuller Company. Burial vault. 4,128,981, Cl. 52-309.300.

Judah, Lewis J.: *See*—
Humbert, Kingsley E., Jr.; and Judah, Lewis J., 4,129,429, Cl. 55-484.000.

Julius & August Erbsloh, Firma: *See*—
Doring, Gerhard, 4,128,934, Cl. 29-460.000.

Kabel-und Metallwerke Gutehoffnungshutte A.G.: *See*—
Hildebrand, Helmut; and Dunker, Gerhard, 4,129,841, Cl. 333-84.00L.

Kabushiki Kaisha Daini Seikosha: *See*—
Inoue, Akira; and Oka, Minori, 4,129,778, Cl. 250-272.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Umeda, Haruhiko; Ito, Ryuji; Yokoyama, Akinori; and Komatsu, Mitsuaki, 4,129,000, Cl. 60-361.000.
Yokoyama, Akinori; and Morinaka, Iwao, 4,128,999, Cl. 60-347.000.

Kabushiki Kaisha Seikosha: *See*—
Yonezawa, Setsuo; Kawakami, Tsuneta; Shimada, Tatsuo; and Chida, Yoshinori, 4,129,860, Cl. 340-324.0AD.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Shigenobu, Hiromichi; Isobe, Toshiaki; and Kondo, Minoru, 4,129,812, Cl. 318-484.000.

Kabushikigaisha Kawaigakkiseisakusho: *See*—
Hoshi, Yoshitomo, 4,129,057, Cl. 84-434.000.

Kaczor, Janusz: *See*—
Biedacha, Roman; Kurdziel, Wladyslaw; Kaczor, Janusz; Smeder, Adam; Kolaczkowski, Jacek; Olszowski, Tadeusz; Nawrocki, Adam; and Rzeszut, Janina, 4,129,169, Cl. 164-166.000.

Kadah, Zagloul B., to Monsanto Company. Solid state switch. 4,129,785, Cl. 250-551.000.

Kaduboski, Mitchell J., to Union Carbide Corporation. Pronged anode collector for internally shorting galvanic cells. 4,129,686, Cl. 429-61.000.

Kaffka, Dietmar, to Lindemann Maschinenfabrik GmbH. Baling presses for the production of bound bales. 4,129,070, Cl. 100-17.000.

Kafunek, Pavel: *See*—
Reichel, Pavel; Kafunek, Pavel; Kovar, Jiri; Pokorny, Oldrich; Zuna, Jaroslav; Kratina, Jindrich; and Pellant, Michal, 4,129,881, Cl. 357-82.000.

Kahane, Lucien, to Union Minerale. Method of grafting a polymer to filler materials. 4,129,549, Cl. 260-40.00R.

Kai, Takaaki: *See*—
Goto, Masuo; Isono, Akira; Momochi, Yasushi; and Kai, Takaaki, 4,129,818, Cl. 322-10.000.

Kajima Kensetsu Kabushiki Kaisha: *See*—
Nakahara, Yasushi; Ohtomo, Tadasuke; Yokota, Shinichi; and Usui, Kazuo, 4,129,008, Cl. 405-303.000.

Kalfoglou, George, to Texaco Inc. Use of organic acid chrome complexes to treat clay containing formations. 4,129,183, Cl. 166-300.000.

Kali & Salz AG: *See*—
Neitzel, Ulrich, 4,129,642, Cl. 423-199.000.

Kalopissis, Gregoire; Jacquet, Bernard; and Lang, Gerard, to L'Oreal. Protecting skin and hair with cosmetic compositions containing superoxide dismutase. 4,129,644, Cl. 424-59.000.

Kamath, Vasanth R.; and Harpell, Gary A., to Pennwalt Corporation. Free-radical polymerizations using mixed initiator systems at two thermally distinct polymerization stages. 4,129,703, Cl. 526-73.000.

Kamoshita, Katsuzo: *See*—
Takemoto, Ichiki; Yoshida, Ryo; Sumida, Seizo; and Kamoshita, Katsuzo, 4,129,436, Cl. 71-120.000.

Kan, Peter T.: *See*—
Cenker, Moses; and Kan, Peter T., 4,129,693, Cl. 521-106.000.

Kanagawa, Shuichi: *See*—
Kudo, Ken-ichi; Kitawaga, Yoshihiko; Koyama, Teruhisa; Takata, Akira; Kanagawa, Shuichi; and Yamaguchi, Tetsuo, 4,129,557, Cl. 526-283.000.

Kang, Jung W.; and Hergenrother, William L., to Firestone Tire & Rubber Company, The. Preparation of 2,3-dihydrofuran. 4,129,579, Cl. 260-346.110.

Kanning, L. Neil, to Pitney-Bowes, Inc. Optical detector which compensates for nonlinearities in a weight measuring system. 4,129,191, Cl. 177-210.00R.

Kaplan, Earl; and Pinto, Frank G., to American Cyanamid Company. Peptizing agent for natural rubber and synthetic butadiene-styrene rubber. 4,129,538, Cl. 260-23.70M.

Kaplan, Irving I.; and Lincoln, Daniel J. Apparatus for digitally encoding the angular position of a shaft with respect to a reference bearing. 4,129,862, Cl. 340-347.00P.

Kaplan, Neil, to Hi-Tech Industries, Inc. Thermosetting molding resin compositions. 4,129,543, Cl. 260-29.15B.

Kaplow, Roy; Frank, Robert I.; and Goodrich, Joel L., to Massachusetts Institute of Technology. Solar-cell array. 4,129,458, Cl. 136-89.0PC.

Kapoor, Devinder S., to Rank Xerox Limited. Rejuvenating electrostatographic carrier particles. 4,129,136, Cl. 134-2.000.

Karasawa, Yoshiharu; Koyama, Tohru; and Narahara, Toshikazu, to Hitachi Chemical Co., Ltd.; and Hitachi, Ltd. Thermosettable, polymerizable resin composition comprising a polyepoxide and a polyisocyanate stabilized by incorporating an organic electron acceptor. 4,129,554, Cl. 528-48.000.

Karlfors, Levi J.: *See*—
Lavon, Erik V.; Lemcke, Bo; and Karlfors, Levi J., 4,129,335, Cl. 299-17.000.

Karlotski, Robert J., to GTE Sylvania Incorporated. Method of manufacturing tungsten halogen lamp. 4,129,348, Cl. 316-20.000.

Karrer, Henry E.: *See*—
Dias, J. Fleming; Karrer, Henry E.; and Tykulsky, Alexander, 4,129,242, Cl. 228-121.000.

Kastinger, Hermann: *See*—
Strohmeier, Helmut, 4,129,319, Cl. 280-615.000.

Kasu, Abdul L.; and Tustaniwskyj, Jerry I., to Burroughs Corporation. Back-up pressure mechanism with tensioned elongated member. 4,129,892, Cl. 360-130.000.

Kataoka, Hiroshi: *See*—
Yasuike, Akio; Kataoka, Hiroshi; and Toyouchi, Kaoru, 4,129,635, Cl. 264-45.500.

Kates, Willard A., to W. A. Kates Company, The. Fluid mixer. 4,129,624, Cl. 261-76.000.

Kato, Shigeo; Morita, Osamu; and Matuoka, Sadao, to Hitachi, Ltd. Two-dimensional precision table. 4,129,291, Cl. 269-73.000.

Kaufman, Michael P.; Kochenderfer, Randal S.; and Crivello, Frank A. Smoker's tool. 4,129,135, Cl. 131-243.000.

Kaufman, Sydney M., to Ford Motor Company. Method for improving the sinterability of iron powder derived from comminuted scrap metal. 4,129,443, Cl. 75-212.000.

Kawabe, Hirokazu; Imai, Kiyoshi; and Miyakoshi, Masanobu, to Nagaoka Co. Ltd.; and Shin-Etsu Chemical Co., Ltd. Roller for cleaning phonograph records. 4,128,909, Cl. 15-104.00A.

Kawagai, Kenji; and Yoshida, Shigeki, to Tokyo Shibaura Electric Co., Ltd. Driver buffer circuit using delay inverters. 4,129,792, Cl. 307-270.000.

Kawai, Kiyohisa: *See*—
Marumoto, Ryuji M.; Furukawa, Yoshiyasu; and Kawai, Kiyohisa, 4,129,654, Cl. 424-251.000.

Kawakami, Kazuhiko, to Hitachi, Ltd. Ignition timing control device of the negative pressure actuation type. 4,129,104, Cl. 123-117.00A.
Kawakami, Tsuneta: *See—*
Yonezawa, Setsuo; Kawakami, Tsuneta; Shimada, Tatsuo; and Chida, Yoshinori, 4,129,860, Cl. 340-324.0AD.
Kawamata, Masanobu: *See—*
Inoue, Sho; Kawamata, Masanobu; Ushimaru, Hirokazu; Nakamichi, Koichi; and Takahashi, Yutaka, 4,129,649, Cl. 424-182.000.
Kawamoto, Itsushi: *See—*
Ito, Osamu; Hobo, Nobuhito; Suzuki, Yutaka; Kawamoto, Itsushi; Naitou, Takashi; Shiozaki, Makoto; and Konishi, Yoshimune, 4,129,105, Cl. 123-119.0EC.
Kawasaki Jukogyo Kabushiki Kaisha: *See—*
Gerstine, Milton I.; Goldberg, Joshua I.; Futatsugi, Setsuo; Ueda, Kazuo; Seo, Ryozo; Iwasaki, Koji; and Uemura, Makoto, 4,129,275, Cl. 244-181.000.
Horiuchi, Kaoru; Matsui, Akio; Hara, Masahiro; and Takahashi, Hiroshi, 4,129,442, Cl. 75-126.00C.
Kawasaki, Ryoichi: *See—*
Ishii, Yasuhiro; Hirose, Shintaro; and Kawasaki, Ryoichi, 4,129,195, Cl. 181-167.000.
Keene, Richard M.: *See—*
Garrett, Michael E.; and Keene, Richard M., 4,129,502, Cl. 210-60.000.
Kees, Ulrich: *See—*
Stoll, Kurt; and Kees, Ulrich, 4,129,147, Cl. 137-596.100.
Kehr, Clifton L.: *See—*
Cogliano, Joseph A.; and Kehr, Clifton L., 4,129,694, Cl. 521-107.000.
Keller, Frank R.; Cataldo, John B.; Kussy, Frank W.; and DiMarco, Bernard, to I-T-E Imperial Corporation. Magnetic trip means for circuit breaker. 4,129,843, Cl. 335-174.000.
Kelly, Charles A.: *See—*
Irick, Gether, Jr.; Kelly, Charles A.; and Martin, James C., 4,129,723, Cl. 542-416.000.
KemaNord AB: *See—*
Larsson, Karl-Georg, 4,129,484, Cl. 204-101.000.
Kennedy, Peter D., to Motorola Inc. Main lobe signal canceller in a null steering array antenna. 4,129,873, Cl. 343-854.000.
Kennedy, Wayne C., to Armstrong Cork Company. Use of an open porous thermoplastic netting as the laminating adhesive in forming a mineral wool fiberboard product. 4,129,637, Cl. 264-112.000.
Kenney, Jerald R. Golf putting training device. 4,129,301, Cl. 273-186.00R.
Kent, David P., to Control Process, Inc. Bulk product slicing system. 4,129,053, Cl. 83-69.000.
Kent, Thomas B., to Solar Control Corporation. Solar air flow controller and system. 4,129,116, Cl. 126-270.000.
Keppler, Hans G.; Stahnecker, Erhard; and Moeller, Rolf, to BASF Aktiengesellschaft. Manufacture of styrene suspension polymers. 4,129,706, Cl. 526-201.000.
Kerb, Ulrich: *See—*
Wiechert, Rudolf; Bittler, Dieter; Kerb, Ulrich; Casals-Stenzel, Jorge; and Losert, Wolfgang, 4,129,564, Cl. 260-239.570.
Kerbs, Reuben. Sleeping bag liner. 4,128,908, Cl. 5-334.00C.
Kerstens, Franciscus N. A., to U.S. Philips Corporation. Resonant cavity magnetron with choke structure for reducing harmonics in output system. 4,129,834, Cl. 331-91.000.
Keyzer, Carl A., to Fiat-Allis Construction Machinery, Inc. Engine air heater and starting circuits to by-pass auxiliary steering circuit. 4,129,001, Cl. 60-403.000.
Khazan, Alexander: *See—*
Wengryn, Michael; and Khazan, Alexander, 4,129,187, Cl. 173-117.000.
Kidd, Archibald W. Tip-up vehicles. 4,129,333, Cl. 298-22.00R.
Kiehs, Karl; and Huber, Rolf, to BASF Aktiengesellschaft. Pyrocatechol derivatives. 4,129,601, Cl. 568-593.000.
Kihara, Yoshio, to Sanwa Industries, Ltd. Needle bar disengaging device for sewing machines. 4,129,084, Cl. 112-221.000.
Kimball International, Inc.: *See—*
Whittington, Billy J.; Burns, Timothy L.; and Welsh, Alan B., 4,129,055, Cl. 84-1.010.
Kimura, Yoshimasa: *See—*
Miyamoto, Koichi; Tohyama, Yoshikuni; Sagara, Seiji; Kimura, Yoshimasa; and Ishida, Masato, 4,129,377, Cl. 355-14.000.
Kinbara, Setsuro, to Japan Atomic Energy Research Institute. Counting process for time-to-digital converting circuits. 4,129,830, Cl. 324-186.000.
King, Walter J.; Snook, James C.; and Peters, Kenneth, to Chloride Group Limited. Electric storage batteries. 4,129,692, Cl. 429-234.000.
Kingsley, Jack D.; and Yang, Kei-Hsiung, to General Electric Company. Photocontrolled ion-flow electron radiography apparatus with multi-layered mesh structure. 4,129,779, Cl. 250-315.00A.
Kirsch, Bernhard. Windows and doors. 4,128,967, Cl. 49-318.000.
Kishitani, Keisuke, to Caterpillar Mitsubishi Ltd. Chain with bushing protective cover. 4,129,045, Cl. 74-255.00R.
Kisselow, Alexander W.; and Wulk, Peter K., to British Petroleum Company Limited, The. Lubricating greases. 4,129,512, Cl. 252-51.50A.
Kitajima, Masaharu: *See—*
Taguchi, Kazumasa; Nishida, Tsutomu; Kitajima, Masaharu; Aketa, Kan; Fujita, Isao; Onoda, Mamoru; Imanishi, Nobuyuki; and Watanabe, Ryo, 4,129,437, Cl. 75-5.000.
Kitawaga, Yoshihiko: *See—*
Kudo, Ken-ichi; Kitawaga, Yoshihiko; Koyama, Teruhisa; Takata, Akira; Kanagawa, Shuichi; and Yamaguchi, Tetsuo, 4,129,557, Cl. 526-283.000.
Kiuchi, Mitsuyuki: *See—*
Amagami, Keizo; Nakamura, Masatatsu; Kominami, Hideyuki; Funakoshi, Kouji; Kiuchi, Mitsuyuki; and Mizukawa, Takumi, 4,129,767, Cl. 219-10.49R.
Klahn, Dale H.: *See—*
Johansson, Eric B.; Klahn, Dale H.; and Marlowe, Mickey O., 4,129,477, Cl. 176-73.000.
Klaubert, Dieter H.: *See—*
Sellstedt, John H.; and Klaubert, Dieter H., 4,129,735, Cl. 544-132.000.
Klaus-Gerd Hoes, Firma: *See—*
Ruge, Hans, 4,129,399, Cl. 404-118.000.
Klein, Edmund. Treatment of acne. 4,129,647, Cl. 424-92.000.
Klein, Gerald B. Gated can end with shear offset defining gate and method for manufacture of the same. 4,129,085, Cl. 113-121.00C.
Klein, H. Joseph: *See—*
Matthews, Steven J.; Klein, H. Joseph; and Hodge, Frank G., 4,129,464, Cl. 148-162.000.
Kleindienst & Co. Maschinenfabrik, Firma: *See—*
Geiger, Friedrich, 4,128,953, Cl. 38-56.000.
Knab, Emil D., to Bell Telephone Laboratories, Incorporated. Method and apparatus for manufacturing optical communication cables. 4,129,468, Cl. 156-148.000.
Knecht, John E. Slope detector for indicating flat tires and the like. 4,129,852, Cl. 340-58.000.
Knipp, Ulrich: *See—*
Boden, Heinrich; and Knipp, Ulrich, 4,129,636, Cl. 264-51.000.
Knutsson, Kent I., to AB Ziristor. Method for making packing containers. 4,129,467, Cl. 156-84.000.
Kobayashi, Haruo; and Imura, Toshinori, to Minolta Camera Kabushiki Kaisha. Parallax compensating device for the view finder in a camera. 4,129,369, Cl. 354-197.000.
Kobayashi, Katsuyoshi: *See—*
Miyasita, Satoru; Taniguchi, Masahiko; and Kobayashi, Katsuyoshi, 4,129,289, Cl. 266-195.000.
Kobayashi, Kengo; Mogami, Masayuki; Tanaka, Shigeyoshi; Nakao, Manabu; and Tamura, Sadao, to Hitachi Chemical Co., Ltd.; and Chugoku Marine Paints, Ltd. Water-soluble coating composition for ship bottoms. 4,129,610, Cl. 260-837.00R.
Kobe Steel, Ltd.: *See—*
Taguchi, Kazumasa; Nishida, Tsutomu; Kitajima, Masaharu; Aketa, Kan; Fujita, Isao; Onoda, Mamoru; Imanishi, Nobuyuki; and Watanabe, Ryo, 4,129,437, Cl. 75-5.000.
Kochenderfer, Randal S.: *See—*
Kaufman, Michael P.; Kochenderfer, Randal S.; and Crivello, Frank A., 4,129,135, Cl. 131-243.000.
Kodama, Yutaka: *See—*
Saikawa, Isamu; Takano, Shuntaro; Imaizumi, Hiroyuki; Takakura, Isamu; Ochiai, Hirokazu; Yasuda, Takashi; Taki, Hideo; Tai, Masaru; and Kodama, Yutaka, 4,129,730, Cl. 544-21.000.
Koellner, Guido. Multiple hanger. 4,129,218, Cl. 211-116.000.
Kohnert, Hans J.; and Smetan, Herbert, to Mahle GmbH. Austenitic cast iron. 4,129,309, Cl. 277-189.500.
Koike, Sakae; Matsunami, Shoichi; and Fujiwara, Yasuo, to Mitsubishi Chemical Industries, Ltd. Method of removing nitrogen oxides in exhaust combustion gases. 4,129,651, Cl. 423-235.000.
Koizumi, Ken-ichi: *See—*
Suzuki, Suzuo; Nakajima, Masayasu; Koizumi, Ken-ichi; and Ookubo, Yoshio, 4,128,997, Cl. 60-274.000.
Kojima, Shokichi. Soil-hardening composition. 4,129,449, Cl. 106-95.000.
Kolaczkowski, Jacek: *See—*
Biedacha, Roman; Kurdziel, Wladyslaw; Kaczor, Janusz; Smeder, Adam; Kolaczkowski, Jacek; Olszowski, Tadeusz; Nawrocki, Adam; and Rzeszut, Janina, 4,129,169, Cl. 164-166.000.
Komatsu, Mitsuaki: *See—*
Umeda, Haruhiko; Ito, Ryuji; Yokoyama, Akinori; and Komatsu, Mitsuaki, 4,129,000, Cl. 60-361.000.
Kominami, Hideyuki: *See—*
Amagami, Keizo; Nakamura, Masatatsu; Kominami, Hideyuki; Funakoshi, Kouji; Kiuchi, Mitsuyuki; and Mizukawa, Takumi, 4,129,767, Cl. 219-10.49R.
Komine, Yoshio, to Canon Kabushiki Kaisha. Sound motion picture camera. 4,129,363, Cl. 352-29.000.
Kondo, Minoru: *See—*
Shigenobu, Hiromichi; Isobe, Toshiaki; and Kondo, Minoru, 4,129,812, Cl. 318-484.000.
Konishi, Yoshimune: *See—*
Ito, Osamu; Hobo, Nobuhito; Suzuki, Yutaka; Kawamoto, Itsushi; Naitou, Takashi; Shiozaki, Makoto; and Konishi, Yoshimune, 4,129,105, Cl. 123-119.0EC.
Konno, Daisuke; and Tanaka, Tetsuo, to Ebara Corporation. Sealing means for tank mixer. 4,129,306, Cl. 277-30.000.
Konovalov, Evmeny G., deceased: *See—*
Ignashev, Evgeny P.; Konovalov, Evmeny G., deceased; Konovalov, Georgy E., administrator; and Zaitseva, Nina E., administrator, 4,129,027, Cl. 72-429.000.
Konovalov, Georgy E., administrator: *See—*
Ignashev, Evgeny P.; Konovalov, Evmeny G., deceased; Konovalov, Georgy E., administrator; and Zaitseva, Nina E., administrator, 4,129,027, Cl. 72-429.000.
Kooi, John H.; Schure, Ralph M.; and Brown, John M., to Unitech

Chemical Inc. Hot melt adhesive having both high peel and tensile shear strength. 4,129,607, Cl. 260-835.000.

Koppelman, Edward. Process for making coke from cellulosic materials and fuels produced therefrom. 4,129,420, Cl. 44-51.000.

Korenko, Michael K., to United States of America, Energy. Gamma prime hardened nickel-iron based superalloy. 4,129,462, Cl. 148-31.000.

Korischum, Fritz, to Brown, Boveri & Company Limited. Large insulator with particular cemented joint. 4,129,745, Cl. 174-209.000.

Korner, Wolf-Dietrich; and Hartmann, Otto, to Daimler-Benz Aktiengesellschaft. Arrangement of air compressor at a reciprocating piston internal combustion engine. 4,129,404, Cl. 417-364.000.

Koster, William H.: *See*—
Slusarchyk, William A.; Gordon, Eric M.; and Koster, William H., 4,129,731, Cl. 544-21.000.

Kotoh, Keigo: *See*—
Tahara, Kiyokazu; and Kotoh, Keigo, 4,129,868, Cl. 343-6.80R.

Kotsonis, Frank N.: *See*—
Ellison, Robert A.; and Kotsonis, Frank N., 4,129,577, Cl. 260-345.200.

Koumura, Noboru: *See*—
Fujii, Motoharu; Muramatsu, Takao; Koumura, Noboru; Sugiura, Susumu; Takekawa, Nobuhiro; and Tsukada, Syusei, 4,129,072, Cl. 101-1.000.

Kovar, Jiri: *See*—
Reichel, Pavel; Kafunek, Pavel; Kovar, Jiri; Pokorny, Oldrich; Zuna, Jaroslav; Kratina, Jindrich; and Pellant, Michal, 4,129,881, Cl. 357-82.000.

Koyama, Teruhisa: *See*—
Kudo, Ken-ichi; Kitawaga, Yoshihiko; Koyama, Teruhisa; Takata, Akira; Kanagawa, Shuichi; and Yamaguchi, Tetsuo, 4,129,557, Cl. 526-283.000.

Koyama, Tohru: *See*—
Karasawa, Yoshiharu; Koyama, Tohru; and Narahara, Toshikazu, 4,129,554, Cl. 528-48.000.

Kozu, Haruo: *See*—
Makuuchi, Keizo; Araki, Kunio; Takagi, Tohru; Nakayama, Hiroyuki; and Kozu, Haruo, 4,129,487, Cl. 204-159.140.

Kraft, Frederick M.: *See*—
Bacotti, Peter A.; and Kraft, Frederick M., 4,129,361, Cl. 351-22.000.

Kratina, Jindrich: *See*—
Reichel, Pavel; Kafunek, Pavel; Kovar, Jiri; Pokorny, Oldrich; Zuna, Jaroslav; Kratina, Jindrich; and Pellant, Michal, 4,129,881, Cl. 357-82.000.

Kraus, Hubert: *See*—
Dahms, Georg; and Kraus, Hubert, 4,128,927, Cl. 29-25.420.

Krause, Herbert: *See*—
Bauer, Josef; Krause, Herbert; and Meltsch, Hans-Juergen, 4,128,931, Cl. 29-239.000.

Krautkramer-Branson, Incorporated: *See*—
Bickel, Wolf, 4,129,041, Cl. 73-657.000.

Kreutz, Werner, to M. Braun GmbH. Curved location-sensitive proportional counter tube. 4,129,782, Cl. 250-379.000.

Krieg & Zivy Industries: *See*—
Godtschalck, Lucien J., 4,129,347, Cl. 312-330.00R.

Kroenke, William J., to B. F. Goodrich Company, The. Smoke retarded polymer compositions containing amine molybdates. 4,129,540, Cl. 260-28.50A.

Krude, Werner, to Uni-Cardan AG. Bearing assembly for a motor vehicle wheel. 4,129,345, Cl. 308-191.000.

Kruseman, Jan; Bertschy, Pierre Y.; and Hidalgo, Jaime, to Societe d'Assistance Technique pour Produits Nestle S.A. Process for the production of a vegetable-based sweetened condensed milk. 4,129,664, Cl. 426-7.000.

Kubrak, Ronald. Device for launching and retrieving a spherical ball. 4,129,110, Cl. 124-16.000.

Kudo, Ken-ichi; Kitawaga, Yoshihiko; Koyama, Teruhisa; Takata, Akira; Kanagawa, Shuichi; and Yamaguchi, Tetsuo, to Sumitomo Chemical Company, Limited. Process for producing copolymerized resins. 4,129,557, Cl. 526-283.000.

Kuehn, Erich: *See*—
Ferrarini, James; and Kuehn, Erich, 4,129,641, Cl. 264-294.000.

Kugelfischer Georg Schafer & Co.: *See*—
Hormann, Karl; and Weigand, Hans, 4,129,344, Cl. 308-187.000.

Kuhla, Donald E., to Pfizer Inc. Quaternary salts as hypoglycemic agents. 4,129,567, Cl. 546-121.000.

Kuhn, Gerhard: *See*—
Lohmann, Joachim W.; Lapp, Otto; and Kuhn, Gerhard, 4,129,446, Cl. 96-74.000.

Kuiper, Dan B.: *See*—
Bader, Ernest, Jr.; Deckard, John I.; and Kuiper, Dan B., 4,129,253, Cl. 239-88.000.
Bader, Ernest, Jr.; Deckard, John I.; and Kuiper, Dan B., 4,129,254, Cl. 239-96.000.
Bader, Ernest, Jr.; Deckard, John I.; and Kuiper, Dan B., 4,129,255, Cl. 239-96.000.
Bader, Ernest, Jr.; Deckard, John I.; and Kuiper, Dan B., 4,129,256, Cl. 239-96.000.

Kunda, Wasyl; and Hitesman, Roderick H., to Sherritt Gordon Mines Limited. Recovery of silver from silver containing solutions. 4,129,441, Cl. 75-118.00R.

Kunstle, Gerhard; Spes, Hellmuth; and Siegl, Herbert, to Wacker-Chemie GmbH. Process for the continuous preparation of acetoacetamides. 4,129,596, Cl. 260-561.00K.

Kuntz, Martin, Jr. Support device for a trailer. 4,129,322, Cl. 280-766.000.

Kurdziel, Wladyslaw: *See*—
Biedacha, Roman; Kurdziel, Wladyslaw; Kaczor, Janusz; Smeder, Adam; Kolaczkowski, Jacek; Olszowski, Tadeusz; Nawrocki, Adam; and Rzeszut, Janina, 4,129,169, Cl. 164-166.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Murayama, Naohiro; Nakamura, Kenichi; and Endo, Shunzo, 4,129,608, Cl. 260-836.000.

Kurita Machinery Manufacturing Company Limited: *See*—
Kurita, Tetsuya; and Hara, Toshifumi, 4,129,137, Cl. 134-144.000.

Kurita, Tetsuya; and Hara, Toshifumi, to Kurita Machinery Manufacturing Company Limited. Washing apparatus for filter press. 4,129,137, Cl. 134-144.000.

Kurtz, Bruce E.: *See*—
Fitch, Robert H.; Kurtz, Bruce E.; and Smura, Bronislaw B., 4,129,495, Cl. 204-279.000.

Kussy, Frank W.: *See*—
Keller, Frank R.; Cataldo, John B.; Kussy, Frank W.; and DiMarco, Bernard, 4,129,843, Cl. 335-174.000.

Kyowa Gas Chemical Industry Co., Ltd.: *See*—
Nagai, Haruo; Uehara, Hiroshi; and Nunokawa, Kunikazu, 4,129,524, Cl. 252-478.000.

Labaz: *See*—
Pigerol, Charles; de Cointet de Fillain, Paul; and Bazile, Yves, 4,129,572, Cl. 260-326.12R.

Laboratoire Roger Bellon: *See*—
Pesson, Marcel, 4,129,737, Cl. 544-279.000.

Laffay, Gilbert: *See*—
El-Souessi, Monti; Laffay, Gilbert; and Neuschwander, Jean-Christian, 4,129,188, Cl. 173-120.000.

Lahme, Norbert; and Sassmannshausen, Gunter, to Accumulatorenwerk Hoppecke. Reaction catalyst for the elimination of oxyhydrogen gas in lead-acid storage batteries. 4,129,687, Cl. 429-86.000.

Laimer, Friedrich; and Moser, Peter, to Vereinigte Osterreichische Eisen-und Stahlwerke - Alpine Montan Aktiengesellschaft. Hood to be used in a metal production plant. 4,129,288, Cl. 266-158.000.

Lambden, Martin R., to Quest Automation Limited. Electrographic apparatus and hand rest for use therewith. 4,129,746, Cl. 178-18.000.

Landis, Abraham L.: *See*—
Bilow, Norman; Landis, Abraham L.; and Miller, Leroy J., 4,129,570, Cl. 528-128.000.

Landis & Gyr: *See*—
Greenaway, David L., 4,129,382, Cl. 356-71.000.

Landstingens Inkopscentral Lic, Ekonomisk Forening: *See*—
Marsh, Gunnar; Henriksen, Ole; and Sjoblum, Urban C. S., 4,128,903, Cl. 3-19.000.

Lang, Gerard: *See*—
Kalopissis, Gregoire; Jacquet, Bernard; and Lang, Gerard, 4,129,644, Cl. 424-59.000.

Lang, Hans-Jochen; and Muschaweck, Roman, to Hoechst Aktiengesellschaft. Thiazolidine derivatives, salidiuretic compositions and methods of effecting salidiuresis employing them. 4,129,656, Cl. 424-263.000.

Lang, Norbert D.: *See*—
Lawson, Herman L.; and Lang, Norbert D., 4,129,331, Cl. 296-100.000.

Lanin, Jackob: *See*—
Lanin, Semyon; and Lanin, Jackob, 4,129,264, Cl. 241-285.00R.

Lanin, Semyon; and Lanin, Jackob. Soundproof hopper. 4,129,264, Cl. 241-285.00R.

Lapp, Otto: *See*—
Lohmann, Joachim W.; Lapp, Otto; and Kuhn, Gerhard, 4,129,446, Cl. 96-74.000.

Larinoff, Michael W., to Hudson Products Corporation. Vapor condensing apparatus. 4,129,180, Cl. 165-113.000.

Larson, Charles L., to Jeddeloh Bros. Sweed Mills, Inc. Portable, hand-held gun for dispensing multiple fluidic components to a mixer. 4,129,231, Cl. 222-145.000.

Larson, Hugo R.: *See*—
Ridenour, Charles E.; Fabert, Herman A., Jr.; Tasker, John; and Larson, Hugo R., 4,129,773, Cl. 219-146.230.

Larsson, Karl-Georg, to KemaNord AB. Process for regeneration of spent reaction solutions. 4,129,484, Cl. 204-101.000.

Laserplane Corporation: *See*—
Teach, Ted L., 4,129,224, Cl. 214-763.000.

Lash, Ronald J., to M&T Chemicals Inc. Electroplating iron group metal alloys. 4,129,482, Cl. 204-43.00T.

Laughlin, Richard H., to Varo, Inc. Active imaging system using time programmed dwell. 4,129,780, Cl. 250-333.000.

Lavezzari, Piero: *See*—
Portinari, Antonio; and Lavezzari, Piero, 4,129,466, Cl. 156-48.000.

Lavon, Erik V.; Lemcke, Bo; and Karlfors, Levi J., to Atlas Copco Aktiebolag. Fluid jet method and device for breaking hard material. 4,129,335, Cl. 299-17.000.

Lawson, Herman L.; and Lang, Norbert D. Retractable cover for open top container. 4,129,331, Cl. 296-100.000.

Le Material Telephonique: *See*—
Depouilly, Bernard M. H.; and Issenmann, Edouard M. J. A. I., 4,129,756, Cl. 179-175.20R.

Lech, Richard J., to International Harvester Company. Clutch modulator. 4,129,148, Cl. 137-596.000.

Lechner, Hanspeter, to Mettler Instrumente AG. Weighing apparatus including display control means. 4,129,190, Cl. 177-155.000.

Lecoeuche, Jacques: *See—*
Bregeault, Marc; Lecoeuche, Jacques; and Margrain, Pierre, 4,129,808, Cl. 318-254.000.

Lee, David N.: *See—*
Degras, James C.; and Lee, David N., 4,129,267, Cl. 242-107.40A.

Lee, Joseph L., to Lee, Stephen Andrew. Revolver-type hand gun. 4,128,957, Cl. 42-65.000.

Lee, Stephen Andrew: *See—*
Lee, Joseph L., 4,128,957, Cl. 42-65.000.

Leftheris, Basil P.; Mainhardt, Joseph H.; and Schwenk, Walter, to Grumman Aerospace Corporation. Method and apparatus for working a hole. 4,129,028, Cl. 72-430.000.

Lehtovaara, Ritva M. Bearing assembly for barbecues. 4,129,111, Cl. 126-25.0AA.

Lekim, Dac: *See—*
Betzing, Hans; and Lekim, Dac, 4,129,650, Cl. 424-211.000.

Leland Stanford Jr. University, The Board of Trustees of: *See—*
Escher, Sina; and Dubois, Grant E., 4,129,599, Cl. 260-586.00E.

Lemcke, Bo: *See—*
Lavon, Erik V.; Lemcke, Bo; and Karlfors, Levi J., 4,129,335, Cl. 299-17.000.

Lemcke, Howard R., Jr., to Caterpillar Tractor Co. Gear shift control. 4,129,046, Cl. 74-473.00P.

Lenglet, Henry, to Regie Nationale des Usines Renault. Nozzle for blowing molds or cores for sand casting. 4,129,160, Cl. 141-388.000.

Lenhard, Robert H.: *See—*
Bernstein, Seymour; Lenhard, Robert H.; and Conrow, Ransom B., 4,129,591, Cl. 260-506.000.

Lerner, Pierre: *See—*
Galaj, Stanislas; Hochon, Bernard; and Lerner, Pierre, 4,129,552, Cl. 260-45.9QB.

Lester, Robert W.; and Hotto, Robert, to Camin Research Corp. Patient monitoring system. 4,129,125, Cl. 128-2.05R.

Leutenegger, Bernhard, to Logotronic AG. Apparatus for indicating the level of liquids in the containers or watercraft. 4,129,038, Cl. 73-307.000.

Lever Brothers Company: *See—*
Rubin, Fred K., 4,129,423, Cl. 51-304.000.

Levine, Seymour: *See—*
Bandurco, Victor T.; and Levine, Seymour, 4,129,653, Cl. 424-251.000.

Lewandowski, Joseph T.: *See—*
Horowitz, Harold S.; Longo, John M.; and Lewandowski, Joseph T., 4,129,525, Cl. 252-518.000.

Lewis, Roger N.; Pastorino, Ronald L.; and Wilts, James F., to Argus Chemical Corporation. Thermally stable high molecular weight acyl peroxycarbonic esters in polyester curing. 4,129,613, Cl. 260-861.000.

Lieske, Edgar: *See—*
Rose, David; Weinrich, Erwin; and Lieske, Edgar, 4,129,413, Cl. 8-10.200.
Rose, David; Saygin, Ferdi; and Lieske, Edgar, 4,129,414, Cl. 8-10.200.

Lighthouse Fireplaces, Inc.: *See—*
Hiser, William H., 4,129,114, Cl. 126-122.000.

Lim-Holding, S.A.: *See—*
Schmidt, Oskar; and Sibral, Walter, 4,129,741, Cl. 560-50.000.

Limb, John O., to Bell Telephone Laboratories, Incorporated. Video coder for color signals. 4,129,882, Cl. 358-13.000.

Lincoln, Daniel J.: *See—*
Kaplan, Irving I.; and Lincoln, Daniel J., 4,129,862, Cl. 340-347.00P.

Lincoln Logotype Co., Inc.: *See—*
Beaver, Millard B.; Johnson, Leonard L.; Hart, Harry L.; and Mahoney, Tennis, 4,129,074, Cl. 101-35.000.

Lindemann Maschinenfabrik GmbH: *See—*
Kaffka, Dietmar, 4,129,070, Cl. 100-17.000.

Lindner, Adolf, to Siemens Aktiengesellschaft. Brake device for drive motors. 4,129,797, Cl. 310-77.000.

Lindsey, Keith E.; and Lindsey, L. E. Stringing block assembly adapted to be threaded by helicopter. 4,129,287, Cl. 254-134.3PA.

Lindsey, L. E.: *See—*
Lindsey, Keith E.; and Lindsey, L. E., 4,129,287, Cl. 254-134.3PA.

Lion Fat & Oil Co., Ltd., The: *See—*
Ogoshi, Toshiaki; Nakamura, Masayoshi; and Yamane, Izumi, 4,129,511, Cl. 252-140.000.
Ogoshi, Toshiaki; Nakamura, Masayoshi; and Yazaki, Mituyoshi, 4,129,526, Cl. 252-536.000.

Littell, Edmund R. Plate handling apparatus with load deflection compensation. 4,129,328, Cl. 294-65.000.

Loboda, Robert S., to UOP Inc. Hydrocarbon reforming process. 4,129,496, Cl. 208-134.000.

Loffelholz, Eberhard. Ski pole. 4,129,312, Cl. 280-11.37Z.

Logotronic AG.: *See—*
Leutenegger, Bernhard, 4,129,038, Cl. 73-307.000.

Lohmann, Joachim W.; Lapp, Otto; and Kuhn, Gerhard, to AGFA-Gevaert Aktiengesellschaft. Color photographic recording material. 4,129,446, Cl. 96-74.000.

Lohsl, Gerald A., to Telephone Utility Terminal Co., Inc. Terminal box for underground electrical conductors. 4,129,743, Cl. 174-38.000.

Lok, Brent M.: *See—*
Flanigen, Edith M.; Lok, Brent M.; and Mumbach, Norbert R., 4,129,450, Cl. 106-120.000.

Longo, James J., to DHP Corporation. Method of removing dental cement. 4,129,456, Cl. 134-1.000.

Longo, John M.: *See—*
Horowitz, Harold S.; Longo, John M.; and Lewandowski, Joseph T., 4,129,525, Cl. 252-518.000.

Longo, Joseph F., to International Dynetics Corporation. Self-powered bucket arrangement. 4,129,329, Cl. 294-70.000.

Lopez, Martha Z. Method of applying decorative designs to surfaces. 4,129,669, Cl. 427-282.000.

L'Oreal: *See—*
Kalopissis, Gregoire; Jacquet, Bernard; and Lang, Gerard, 4,129,644, Cl. 424-59.000.
Viout, Andre; and Pasero, Regine, 4,129,711, Cl. 526-286.000.

Lorenz, Donald H.; Tu, Shu-Tung; and Wyman, Donald P., to GAF Corporation. Radiation curable coating composition comprising an acryl urethane oligomer and an ultra-violet absorber. 4,129,667, Cl. 427-44.000.

Lorenz, Donald H.; and Tu, Shu-Tung, to GAF Corporation. Coating composition comprising N-vinyl-2-pyrrolidone and an oligomer. 4,129,709, Cl. 526-264.000.

Lorenzo, Francisco. Eyeglasses. 4,129,362, Cl. 351-123.000.

Losert, Wolfgang: *See—*
Wiechert, Rudolf; Bittler, Dieter; Kerb, Ulrich; Casals-Stenzel, Jorge; and Losert, Wolfgang, 4,129,564, Cl. 260-239.570.

Loughran, James A.: *See—*
Cusano, Dominic A.; Loughran, James A.; and Sun, Yen S. E., 4,129,243, Cl. 228-122.000.

Lowry, John A., to E & I Corporation. Pulverizer hammer for comminutating apparatus. 4,129,262, Cl. 241-197.000.

Lubrizol Corporation, The: *See—*
Friihauf, Edward J., 4,129,508, Cl. 252-33.000.
Smith, Donald M., 4,129,510, Cl. 252-48.600.

Lucas Industries Limited: *See—*
Cryer, Edward, 4,129,757, Cl. 200-4.000.

Ludwig Boschert, Maschinen- und Apparatebau GmbH & Co. KG: *See—*
Fazis, Harald, 4,129,054, Cl. 83-165.000.

Luedtke, Arthur; and Bentley, William F., to United States of America, Federal Communications Commission. Antenna pattern combiner. 4,129,874, Cl. 343-854.000.

Lukens Steel Company: *See—*
Snee, William F., Jr., 4,129,172, Cl. 164-348.000.

Lummus Company, The: *See—*
Tsao, Utah, 4,129,604, Cl. 260-656.00R.

Lupton, Homer B., to Subterranean Tools Inc. Rolling cutter arrangement. 4,129,392, Cl. 403-25.000.

M. Braun GmbH: *See—*
Kreutz, Werner, 4,129,782, Cl. 250-379.000.

M&T Chemicals Inc.: *See—*
Balatan, Sergio E., 4,129,712, Cl. 526-304.000.
Lash, Ronald J., 4,129,482, Cl. 204-43.00T.

MacDonald, Robert C., to Westinghouse Electric Corp. Elevator system. 4,129,199, Cl. 187-29.00R.

Machi, Sueo; Matsui, Yasushi; Sugishita, Akio; Sugo, Takanobu; Taniguchi, Hiroaki; Asano, Koichi; and Fujiwara, Hiroshi, to Japan Atomic Energy Research Institute; and Maruzen Oil Company Limited. Fluoro carbon graft copolymer and process for the production thereof. 4,129,617, Cl. 260-879.000.

Machines Chambon: *See—*
Corse, Louis G., 4,129,065, Cl. 93-58.0ST.

MacLeay, Ronald E.: *See—*
Sheppard, Chester S.; and MacLeay, Ronald E., 4,129,586, Cl. 260-465.00D.

Madison Foods, Inc.: *See—*
Fick, Edwin O., Jr.; and Bell, Edward L., 4,128,916, Cl. 17-52.000.

Maeda, Hidetoshi; Morihisa, Mitsuo; and Sasaki, Takehiko, to Sharp Kabushiki Kaisha. Zero adjustment in an electronic timepiece. 4,128,993, Cl. 58-23.00R.

Maffet, Vere, to UOP Inc. Organic waste drying process. 4,128,946, Cl. 34-12.000.

Mageli, Orville L.; and Swarts, William A., to Pennwalt Corporation. Peroxy compounds and vulcanizable compositions thereof. 4,129,700, Cl. 260-823.000.

Mager, Eric L. Self-limiting board game combining chance and skill. 4,129,304, Cl. 273-243.000.

Maglecic, Steve C.; and Oberholtzer, Larry W., to Maglecic, Steve C. Weight control system. 4,129,189, Cl. 177-123.000.

Magnuson, Arthur P. Compact golf course. 4,129,300, Cl. 273-176.00A.

Mahle GmbH: *See—*
Kohnert, Hans J.; and Smetan, Herbert, 4,129,309, Cl. 277-189.500.

Mahoney, Tennis: *See—*
Beaver, Millard B.; Johnson, Leonard L.; Hart, Harry L.; and Mahoney, Tennis, 4,129,074, Cl. 101-35.000.

Maierhofer, Alfred; and Wagner, Hans, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of high purity S-carboxymethyl-L-cysteine. 4,129,593, Cl. 562-557.000.

Mainhardt, Joseph H.: *See—*
Leftheris, Basil P.; Mainhardt, Joseph H.; and Schwenk, Walter, 4,129,028, Cl. 72-430.000.

Mairs, John H., to Newton, John, a part interest. Heat transfer method and apparatus. 4,129,012, Cl. 62-113.000.

Makhlouf, Joseph M.: *See—*
Christenson, Roger M.; Dowbenko, Rostyslaw; and Makhlouf, Joseph M., 4,129,489, Cl. 204-159.220.

Makuuchi, Keizo; Araki, Kunio; Takagi, Tohru; Nakayama, Hiroyuki; and Kozu, Haruo, to Japan Atomic Energy Research Institute. Process for improving the properties of an aqueous emulsion type coating composition. 4,129,487, Cl. 204-159.140.

Malinowski, William J., to Chloride Incorporated. Smoke detector and housing assembly therefore. 4,129,383, Cl. 356-439.000.
Malivoir, Roger: *See—*
Pierrel, Michel; and Malivoir, Roger, 4,129,171, Cl. 164-292.000.
Mangal, Norman F.: *See—*
Hori, Tatsu; Gardiner, Kenneth W.; and Mangal, Norman F., 4,129,295, Cl. 271-186.000.
Mannesmann Aktiengesellschaft: *See—*
Thonnes, Horst; and Wunsche, Joachim, 4,129,022, Cl. 72-41.000.
Mannuzza, Frank: *See—*
Collier, Harry O. J.; Saeed, Sheikh A.; Schneider, Cyril; and Mannuzza, Frank, 4,129,648, Cl. 424-101.000.
Manufacture de Vilebrequins de Lorette S.A.: *See—*
Berthier, Pierre, 4,129,401, Cl. 408-59.000.
Marason, Gabriel, Jr.; Melzian, John M.; and Pitkanen, Alan R., to Mattel, Inc. Toy clock using marbles. 4,128,949, Cl. 35-39.000.
Marass, Josef, to Georg Spiess GmbH. Sheet-feeding mechanism acting on front corner regions of a sheet. 4,129,294, Cl. 271-93.000.
Marconi Company Limited, The: *See—*
Wallington, John R.; and Greed, Robert B., 4,129,838, Cl. 333-7.00D.
Marek, Larry L. Weight arrestor. 4,128,960, Cl. 43-27.400.
Margrain, Pierre: *See—*
Bregeault, Marc; Lecoeuche, Jacques; and Margrain, Pierre, 4,129,808, Cl. 318-254.000.
Maricle, Donald L., to United Technologies Corp. Anhydrous $H_2/Cl_2$ regenerative fuel cell. 4,129,683, Cl. 429-21.000.
Mark, Victor: *See—*
Axelrod, Robert J.; Mark, Victor; and Wilson, Phillip S., 4,129,546, Cl. 260-31.80T.
Markusch, Peter; Dieterich, Dieter; and Dietrich, Manfred, to Bayer Aktiengesellschaft. Process for the production of inorganic-organic plastic composites. 4,129,696, Cl. 521-154.000.
Marley Company, The: *See—*
Fordyce, Homer E.; and Carter, William C., 4,129,625, Cl. 261-111.000.
Marlowe, Mickey O.: *See—*
Johansson, Eric B.; Klahn, Dale H.; and Marlowe, Mickey O., 4,129,477, Cl. 176-73.000.
Marra, Michael R.; and Del Deo, Joseph, to Cowan Plastic Products Corporation. Exhibiting device. 4,128,955, Cl. 40-489.000.
Marrs, Oren L.; and Reusser, Robert E., to Phillips Petroleum Company. Asphaltic compositions containing conjugated diene-monovinyl-substituted aromatic hydrocarbon copolymers of particular structures. 4,129,541, Cl. 260-28.5AS.
Marsh, Gunnar; Henrikssen, Ole; and Sjoblum, Urban C. S., to Landstingens Inkopscentral Lic, Ekonomisk Forening. Temporary walking aid for use after lower leg amputations. 4,128,903, Cl. 3-19.000.
Marshall, Robert M.; Pak, Sung K.; and Dardoufas, Kimon C., to Allied Chemical Corporation. Spin finish for polyamide yarn. 4,129,507, Cl. 252-8.900.
Martin, Aubrey W., to Republic Rubber Industries (Prop.) Ltd. Retreading of tires. 4,129,474, Cl. 156-394.000.
Martin, Carl J.; and Ryan, Robert J., to RCA Corporation. Vinyl chloride based injection molding composition. 4,129,536, Cl. 260-23.0XA.
Martin, James C.: *See—*
Irick, Gether, Jr.; Kelly, Charles A.; and Martin, James C., 4,129,723, Cl. 542-416.000.
Martin, Larry C.: *See—*
Bula, John; and Martin, Larry C., 4,129,793, Cl. 307-270.000.
Marumoto, Ryuji M.; Furukawa, Yoshiyasu; and Kawai, Kiyohisa, to Takeda Chemical Industries, Ltd. Isoxazolo[3,4-D]pyrimidines useful as antiinflammatory-analgesic agents. 4,129,654, Cl. 424-251.000.
Maruzen Oil Company Limited: *See—*
Machi, Sueo; Matsui, Yasushi; Sugishita, Akio; Sugo, Takanobu; Taniguchi, Hiroaki; Asano, Koichi; and Fujiwara, Hiroshi, 4,129,617, Cl. 260-879.000.
Marvin Glass & Associates: *See—*
Meyer, Burton C., 4,129,296, Cl. 272-52.000.
Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft (M.A.N.): *See—*
Fischer, Hermann, 4,129,077, Cl. 101-350.000.
Maschinenfabrik GOEBEL GmbH: *See—*
Herd, Josef, 4,129,238, Cl. 226-29.000.
Masiello, Felix R., to Addressograph-Multigraph Corporation. Paper cassette. 4,129,266, Cl. 242-68.400.
Massachusetts Institute of Technology: *See—*
Kaplow, Roy; Frank, Robert I.; and Goodrich, Joel L., 4,129,458, Cl. 136-89.0PC.
Massey-Ferguson Inc.: *See—*
Dornan, Arthur E., 4,129,047, Cl. 74-474.000.
Hern, John F.; and Buccellato, Joseph L., 4,129,325, Cl. 292-127.000.
Massey-Ferguson Services N.V.: *See—*
Quick, Donald J., 4,129,339, Cl. 302-21.000.
Todeschini, Eugenio; and Riganti, Gian P., 4,129,192, Cl. 180-6.480.
Masuda, Fusayoshi: *See—*
Takematsu, Tetsuo; Masuda, Fusayoshi; Tanaka, Kenji; Nishida, Kazuo; and Nakamura, Akira, 4,129,435, Cl. 71-65.000.
Masuda, Ikuro, to Hitachi, Ltd. Plural-sequence control system. 4,129,901, Cl. 364-104.000.
Matarasso, Pierre: *See—*
Deflandre, Jean; Matarasso, Pierre; and Traisnel, Jean-Pierre, 4,129,360, Cl. 350-289.000.
Matetschlager, Walter: *See—*
Fischer, Karl; and Matetschlager, Walter, 4,129,688, Cl. 429-97.000.
Mateyka, Milan: *See—*
Anderson, Andrew W.; and Mateyka, Milan, 4,129,205, Cl. 198-358.000.
Mathes, Larry W. Basin receptacle. 4,128,905, Cl. 4-187.00R.
Matheson, Alister F.; Tosh, Douglas J.; and Borr, Mitchell, to Uniroyal Ltd. Thermoplastic elastomeric blend of rubber and bituminous material. 4,129,542, Cl. 260-28.5AS.
Matrix IV, Inc.: *See—*
Wenk, Raymond C., 4,128,918, Cl. 24-16.00R.
Matsubara, Isamu, to Yoshida Kogyo K.K. Panel connector assembly. 4,128,983, Cl. 52-731.000.
Matsui, Akio: *See—*
Horiuchi, Kaoru; Matsui, Akio; Hara, Masahiro; and Takahashi, Hiroshi, 4,129,442, Cl. 75-126.00C.
Matsui, Yasushi: *See—*
Machi, Sueo; Matsui, Yasushi; Sugishita, Akio; Sugo, Takanobu; Taniguchi, Hiroaki; Asano, Koichi; and Fujiwara, Hiroshi, 4,129,617, Cl. 260-879.000.
Matsumoto, Junichiro, to Nissan Motor Company, Limited. Variable displacement internal combustion engine with means for switching deactivated cylinder groups at appropriate timing. 4,129,109, Cl. 123-198.00F.
Matsunami, Shoichi: *See—*
Koike, Sakae; Matsunami, Shoichi; and Fujiwara, Yasuo, 4,129,651, Cl. 423-235.000.
Matsushima, Koji: *See—*
Sunamori, Takashi; Matsushima, Koji; and Tanaka, Susumu, 4,129,545, Cl. 260-29.6TA.
Matsushita Electric Industrial Company, Limited: *See—*
Amagami, Keizo; Nakamura, Masatatsu; Kominami, Hideyuki; Funakoshi, Kouji; Kiuchi, Mitsuyuki; and Mizukawa, Takumi, 4,129,767, Cl. 219-10.49R.
Sugimoto, Kazuyasu; Yamaya, Hiroshi; and Ishimoto, Kameki, 4,129,351, Cl. 339-176.0MP.
Matsuzawa, Takashi, to Nemoto Tokusho Kagaku Kabushiki Kaisha. Thermo-luminescent material. 4,129,519, Cl. 252-301.40H.
Mattel, Inc.: *See—*
Marason, Gabriel, Jr.; Melzian, John M.; and Pitkanen, Alan R., 4,128,949, Cl. 35-39.000.
Mattern, Alfred, to Siemens Aktiengesellschaft. Digital time division multiplex telecommunication network. 4,129,750, Cl. 179-15.0AL.
Matthews, Steven J.; Klein, H. Joseph; and Hodge, Frank G., to Cabot Corporation. High yield strength Ni-Cr-Mo alloys and methods of producing the same. 4,129,464, Cl. 148-162.000.
Matuoka, Sadao: *See—*
Kato, Shigeo; Morita, Osamu; and Matuoka, Sadao, 4,129,291, Cl. 269-73.000.
Maurer, Gerald L.: *See—*
Shringarpurey, Sudhir K.; and Maurer, Gerald L., 4,129,509, Cl. 252-49.500.
Mausner, Jack J.: *See—*
Barnett, Gabriel; Gershaw, Nathan; and Mausner, Jack J., 4,129,645, Cl. 424-60.000.
May, Adolf: *See—*
Wallhausser, Karl H.; Cuntze, Ulrich; May, Adolf; and Bucking, Hans-Walter, 4,129,506, Cl. 252-8.800.
Mayer, Franz: *See—*
Egger, Joseph; Mayer, Franz; Schwartz, Herbert; Sodler, Walter; Suard, Jean; and Tilse, Wilhelm, 4,128,992, Cl. 58-23.00D.
Mayfeld, Friedrich. Bucket elevator. 4,129,209, Cl. 198-712.000.
Maytum, James N.: *See—*
Vanlandingham, Harold W.; Boggs, Roger L.; Bullock, David A.; and Maytum, James N., 4,128,932, Cl. 29-401.00R.
McAleer, William J.; and Wasmuth, Edward H., to Merck & Co., Inc. Isolating hepatitis B Dane particles. 4,129,646, Cl. 424-89.000.
McCall, Richard J. Die-cut carton with built-in fillers. 4,129,247, Cl. 229-36.000.
McCallum, David F. Play vehicle. 4,129,315, Cl. 280-87.010.
McCreary, James L.: *See—*
Gray, Paul R.; McCreary, James L.; and Hodges, David A., 4,129,863, Cl. 340-347.0AD.
McCullough, John E., to Arthur D. Little, Inc. Scroll-type liquid pump with transfer passages in end plate. 4,129,405, Cl. 418-55.000.
McCutchen, Hugh L.: *See—*
Tighe, Michael R.; and McCutchen, Hugh L., 4,129,493, Cl. 204-228.000.
McDonnell, Christopher R. S., to Metalife Molecular Belzona Limited. Hardenable resin compositions. 4,129,548, Cl. 260-37.00M.
McFarlane, Richard H. Securing device for catheter placement assembly. 4,129,128, Cl. 128-133.000.
McGinniss, Vincent D., to SCM Corporation. Ultraviolet curable epoxy-polyester powder paints. 4,129,488, Cl. 204-159.190.
McGlynn, Joseph L., Jr., executor: *See—*
Cunningham, Thomas J.; Schwartzberg, Harold L., deceased; and McGlynn, Joseph L., Jr., executor, 4,129,744, Cl. 174-94.00R.
McGraw-Edison Company: *See—*
Tenniswood, David M., 4,129,277, Cl. 248-51.000.
McKee, Ronald H. Vibrator for flowing granular material. 4,129,388, Cl. 366-124.000.
McKendry, Lennon H., to Dow Chemical Company, The. Substituted pyridine thionocarbonyl halides and derivatives. 4,129,733, Cl. 544-131.000.
McKendry, Lennon H., to Dow Chemical Company, The. Substituted pyridine carbonyl halides and derivatives. 4,129,734, Cl. 544-131.000.

McKenzie, Elton L., to FMC Corporation. Citrus slicing apparatus. 4,129,068, Cl. 99-538.000.
McLellan, Norvel J. Chronograph. 4,129,829, Cl. 324-178.000.
Meisei Electric Co. Ltd.: *See—*
Shibata, Toshiji, 4,129,833, Cl. 331-66.000.
Mellbom, Marvin E., to UOP Inc. Vapor-liquid contacting apparatus. 4,129,626, Cl. 261-114.0JP.
Meltsch, Hans-Juergen: *See—*
Bauer, Josef; Krause, Herbert; and Meltsch, Hans-Juergen, 4,128,931, Cl. 29-239.000.
Melzian, John M.: *See—*
Marason, Gabriel, Jr.; Melzian, John M.; and Pitkanen, Alan R., 4,128,949, Cl. 35-39.000.
Menault, Jacques; and Rodier, Henry, to Rhone Poulenc Textile. Spinnable cellulose solution and process for making same. 4,129,451, Cl. 106-168.000.
Merck & Co., Inc.: *See—*
McAleer, William J.; and Wasmuth, Edward H., 4,129,646, Cl. 424-89.000.
Merisio, Alberto, to Somet Societa' Meccanica Tessile S.p.A. Weft carrying gripper for shuttleless looms with stationary weft supply. 4,129,155, Cl. 139-448.000.
Merry, Raymond: *See—*
Jones, Andrew W.; and Merry, Raymond, 4,129,272, Cl. 244-153.00R.
Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung: *See—*
Heinze, Horst; Stierle, Gunter; and Sach, Ernst D., 4,128,921, Cl. 24-279.000.
Messner, Harold D., to Chevron Research Company. Determination of remanent magnetization of an earth formation penetrated by a bore hole using a magnetometer-followed by processing of data including micropulsation data. 4,129,821, Cl. 324-8.000.
Metalife Molecular Belzona Limited: *See—*
McDonnell, Christopher R. S., 4,129,548, Cl. 260-37.00M.
Meteor AG: *See—*
Schmid, Hans, 4,129,158, Cl. 140-149.000.
Mettler Instrumente AG: *See—*
Lechner, Hanspeter, 4,129,190, Cl. 177-155.000.
Meyer, Burton C., to Marvin Glass & Associates. Riding toy with removable body portion. 4,129,296, Cl. 272-52.000.
Michalko, Edward, to UOP Inc. Preparation of silica-alumina macrospheres. 4,129,522, Cl. 252-453.000.
Michel, Karl H.; and Higgens, Calvin E., to Eli Lilly and Company. A-40104 antibiotics and process for production thereof. 4,129,721, Cl. 536-17.000.
Michel, Rudolf: *See—*
Buder, Wolfgang; Pletka, Hans-Dieter; Michel, Rudolf; Schwarz, Rudolf; and Dusing, Gerhard, 4,129,585, Cl. 260-448.80R.
Michelson, Anatol, to Ashland Oil, Inc. Catalyst gas generating circuit for rotary core making machine. 4,129,168, Cl. 164-159.000.
Michon, Gerald J., to General Electric Company. Solid stage imaging apparatus. 4,129,887, Cl. 358-213.000.
Midoux, Nicolas: *See—*
Moll, Manfred; D'Hardmemare, Christian; and Midoux, Nicolas, 4,129,029, Cl. 73-19.000.
Miles Laboratories, Inc.: *See—*
Johnson, Leighton C., 4,129,093, Cl. 118-401.000.
White, William I., 4,129,417, Cl. 23-230.00B.
Wied, George L.; Bahr, Gunter F.; and Puls, James H., 4,129,381, Cl. 356-36.000.
Miller, Helmut, to Escher Wyss Limited. Rim-type hydroelectric machine. 4,129,786, Cl. 290-52.000.
Miller, Leroy J.: *See—*
Bilow, Norman; Landis, Abraham L.; and Miller, Leroy J., 4,129,570, Cl. 528-128.000.
Miller, Wayne D.: *See—*
Butterworth, George A. M.; Elias, Robert T.; and Miller, Wayne D., 4,129,132, Cl. 128-287.000.
Mills, Chester R., to RCA Corporation. Circuit test apparatus. 4,129,826, Cl. 324-57.0SS.
Mindt, Wolfgang: *See—*
Racine, Philippe; Higelin, Jean-Claude; Engelhardt, Roland; and Mindt, Wolfgang, 4,129,478, Cl. 204-1.00T.
Minnesota Mining and Manufacturing Company: *See—*
Charbonneau, Robert R.; and Spatafore, Robert M., 4,128,984, Cl. 52-746.000.
Mino, Guido; and Behrens, Rudolf A., to American Cyanamid Company. Polyacrylate elastomer compositions. 4,129,708, Cl. 526-218.000.
Minolta Camera Kabushiki Kaisha: *See—*
Kobayashi, Haruo; and Imura, Toshinori, 4,129,369, Cl. 354-197.000.
Minton, Darrell B.: *See—*
Argentine, Jeffery C.; and Minton, Darrell B., 4,129,815, Cl. 318-601.000.
Misumi, Akira: *See—*
Soeno, Ko; Iizuka, Tomio; Doi, Toshio; Ando, Hisashi; Oyama, Testuo; Sakamoto, Hiroshi; and Misumi, Akira, 4,129,801, Cl. 313-346.00R.
Mitsubishi Chemical Industries, Ltd.: *See—*
Koike, Sakae; Matsunami, Shoichi; and Fujiwara, Yasuo, 4,129,651, Cl. 423-235.000.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Morinaka, Akiyoshi, 4,129,869, Cl. 343-6.80R.
Tabuchi, Yasuhide, 4,129,353, Cl. 339-242.000.
Tahara, Kiyokazu; and Kotoh, Keigo, 4,129,868, Cl. 343-6.80R.
Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Torikai, Kiyoshige, 4,129,164, Cl. 164-7.000.
Mitsubishi Rayon Co., Ltd.: *See—*
Sunamori, Takashi; Matsushima, Koji; and Tanaka, Susumu, 4,129,545, Cl. 260-29.6TA.
Mitsuoka, Akio: *See—*
Seki, Masatoshi; Sato, Moriichi; Tsukioka, Hideo; Ohe, Etuo; Ogata, Masatsugu; and Mitsuoka, Akio, 4,129,678, Cl. 428-383.000.
Mitsuyama, Akira: *See—*
Uchida, Katsuzo; Uchiyama, Hiroaki; and Mitsuyama, Akira, 4,129,374, Cl. 355-8.000.
Miyada, Thomas S. Electromagnetic piston engine. 4,129,795, Cl. 310-24.000.
Miyagawa, Yoshitaka: *See—*
Sato, Makoto; Takamatsu, Hiroshi; Miyagawa, Yoshitaka; and Fujii, Etsuo, 4,129,342, Cl. 303-105.000.
Miyakawa, Seiichi; and Eda, Tadahiro, to Ricoh Company, Ltd. Method and apparatus for electrically biasing developing electrode of electrophotography device. 4,129,375, Cl. 355-10.000.
Miyakoshi, Masanobu: *See—*
Kawabe, Hirokazu; Imai, Kiyoshi; and Miyakoshi, Masanobu, 4,128,909, Cl. 15-104.00A.
Miyamoto, Koichi; Tohyama, Yoshikuni; Sagara, Seiji; Kimura, Yoshimasa; and Ishida, Masato, to Canon Kabushiki Kaisha. Variable magnification copying apparatus. 4,129,377, Cl. 355-14.000.
Miyasita, Satoru; Taniguchi, Masahiko; and Kobayashi, Katsuyoshi, to Nippon Steel Corporation. Shaft furnace with bottom discharge device. 4,129,289, Cl. 266-195.000.
Miyata, Hiroyasu; and Iwasaki, Sadayoshi, to Alps Electric Co., Ltd. Indicating mechanism for push button switches. 4,129,766, Cl. 200-308.000.
Mizukawa, Takumi: *See—*
Amagami, Keizo; Nakamura, Masatatsu; Kominami, Hideyuki; Funakoshi, Kouji; Kiuchi, Mitsuyuki; and Mizukawa, Takumi, 4,129,767, Cl. 219-10.49R.
Mobay Chemical Corporation: *See—*
Heiss, Herbert L., 4,129,611, Cl. 260-858.000.
Mochizuki, Kazunori: *See—*
Ban, Itsuki; and Mochizuki, Kazunori, 4,129,889, Cl. 360-75.000.
Moeller, Rolf: *See—*
Keppler, Hans G.; Stahnecker, Erhard; and Moeller, Rolf, 4,129,706, Cl. 526-201.000.
Mogami, Masayuki: *See—*
Kobayashi, Kengo; Mogami, Masayuki; Tanaka, Shigeyoshi; Nakao, Manabu; and Tamura, Sadao, 4,129,610, Cl. 260-837.00R.
Mok, Chuck K., to RCA Corporation. Array of directional filters. 4,129,840, Cl. 333-73.00W.
Molitor, Victor D., to Stainless Equipment Company. Apparatus for utilization of waste energy. 4,129,179, Cl. 165-101.000.
Moll, Manfred; D'Hardmemare, Christian; and Midoux, Nicolas, to Tepral. Device for measuring the amount of gas dissolved in a liquid. 4,129,029, Cl. 73-19.000.
Moller, Walter H., to Western Gear Corporation. Pipe handling apparatus. 4,129,221, Cl. 214-2.500.
Momiyama, Kikuo, to Canon Kabushiki Kaisha. Extending attachment lens. 4,129,359, Cl. 350-183.000.
Momochi, Yasushi: *See—*
Goto, Masuo; Isono, Akira; Momochi, Yasushi; and Kai, Takaaki, 4,129,818, Cl. 322-10.000.
Momura, Takao; Umemoto, Yoshiro; and Sakamoto, Tatsuo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Auto ceiling panel and its manufacturing process. 4,129,672, Cl. 428-138.000.
Monkemoller, Herbert: *See—*
Bergmann, Klaus W.; Steffen, Gunther B. H.; and Monkemoller, Herbert, 4,129,062, Cl. 90-11.00R.
Monsanto Company: *See—*
Anderson, George J.; Desmond, Timothy F.; and Santer, J. Owen, 4,129,681, Cl. 428-524.000.
Boe, Norman W., 4,129,677, Cl. 428-372.000.
Bromley, James E.; Mowe, Wayne T.; and Stutz, Frank, 4,128,989, Cl. 57-247.000.
Clement, Carl J.; Stengel, Fred H.; and Campbell, Kenneth S., 4,129,211, Cl. 206-213.100.
Houbion, John A., 4,129,729, Cl. 542-439.000.
Howe, Robert K., 4,129,568, Cl. 260-307.00F.
Kadah, Zagloul B., 4,129,785, Cl. 250-551.000.
Petrovich, John P.; and Van Eenam, Donald N., 4,129,528, Cl. 260-823.000.
Stewart, Walter P.; and Punte, Lawrence F., 4,129,682, Cl. 428-571.000.
Montedison S.p.A.: *See—*
Credali, Lino; Baruzzi, Giovanni; and Guidotti, Vincenzo, 4,129,559, Cl. 528-337.000.
Montegari, Frank A.: *See—*
Gani, Venkappa L.; and Montegari, Frank A., 4,129,790, Cl. 307-203.000.
Montgomery, Robert M.: *See—*
Neal, Gary W.; and Montgomery, Robert M., 4,129,832, Cl. 331-44.000.
Montreal Engineering Company, Limited: *See—*
Demers, Arthur S.; and Hilz, Lloyd A., 4,129,011, Cl. 405-169.000.
Owen, John A., 4,129,010, Cl. 405-169.000.
Moore, Claud T., Jr. Shovel. 4,129,327, Cl. 294-58.000.
Moore, William P., Jr., to Ashland Oil, Inc. Process for producing

stabilized high strength urea-aldehyde insulating foams. 4,129,533, Cl. 521-117.000.

Moppett, Charles E.: *See—*
Celmer, Walter D.; Cullen, Walter P.; Jefferson, Mark T.; Moppett, Charles E.; Routien, John B.; and Sciavolino, Frank C., 4,129,578, Cl. 260-345.70R.

Morgan Construction Company: *See—*
Sieurin, Donald, 4,129,023, Cl. 72-235.000.

Morihisa, Mitsuo: *See—*
Maeda, Hidetoshi; Morihisa, Mitsuo; and Sasaki, Takehiko, 4,128,993, Cl. 58-23.00R.

Morinaka, Akiyoshi, to Mitsubishi Denki Kabushiki Kaisha. Automatical signalling apparatus. 4,129,869, Cl. 343-6.80R.

Morinaka, Iwao: *See—*
Yokoyama, Akinori; and Morinaka, Iwao, 4,128,999, Cl. 60-347.000.

Morita, Hideo: *See—*
Tamazawa, Tsuyoshi; Suematsu, Masayasu; and Morita, Hideo, 4,129,622, Cl. 261-39.00A.

Morita, Osamu: *See—*
Kato, Shigeo; Morita, Osamu; and Matuoka, Sadao, 4,129,291, Cl. 269-73.000.

Morris, Terrence P., to Guild International, Inc. Strip shearing and joining method and apparatus. 4,129,244, Cl. 228-170.000.

Morris, William F., Jr. Ice storage and dispensing bin. 4,129,015, Cl. 62-344.000.

Morrow, James J., to Fischer & Porter Co. Method of analyzing residual chlorine. 4,129,479, Cl. 204-1.00T.

Morton, Peter H.; Gilbert, John R. B.; and Wortley, John P. A., to Imperial Metal Industries (Kynoch) Limited. Electrolytic cell. 4,129,492, Cl. 204-212.000.

Moser, Peter: *See—*
Laimer, Friedrich; and Moser, Peter, 4,129,288, Cl. 266-158.000.

Moser, Roland: *See—*
Zondler, Helmut; and Moser, Roland, 4,129,556, Cl. 528-97.000.

Moss, Gerald, to Exxon Research & Engineering Co. Fluid distributor. 4,129,411, Cl. 432-58.000.

Motorola Inc.: *See—*
Kennedy, Peter F., 4,129,873, Cl. 343-854.000.
Schrack, Gary L., 4,129,867, Cl. 343-6.80R.

Mott, Richard H.; and Pritchard, Clyde L., to Du-Al Manufacturing Company. Automatic hydraulic series-parallel shift device for implement. 4,129,258, Cl. 239-650.000.

Mowe, Wayne T.: *See—*
Bromley, James E.; Mowe, Wayne T.; and Stutz, Frank, 4,128,989, Cl. 57-247.000.

Mudgett, Donald F., to U.S. Fiber Corporation. Cellulosic insulation blowing machine. 4,129,338, Cl. 302-2.00A.

Muhlethaler, Henri, to Henri Muhlethaler S.A. Apparatus for controlling inner and outer surfaces, of members of mechanics, and utilization of this apparatus. 4,128,943, Cl. 33-174.00Q.

Muir, Ronald J.: *See—*
Eliades, Theo I.; Muir, Ronald J.; and Horner, James D., 4,129,589, Cl. 260-504.00A.

Mumbach, Norbert R.: *See—*
Flanigen, Edith M.; Lok, Brent M.; and Mumbach, Norbert R., 4,129,450, Cl. 106-120.000.

Mumford, Clive J.: *See—*
Jeffreys, Godfrey V.; Mumford, Clive J.; Ravault, Frank E. G.; and Washbourne, Colin, 4,129,500, Cl. 210-23.00R.

Mumper, James E., to Raytheon Company. Balanced transducer. 4,129,850, Cl. 340-10.000.

Murakami, Shuji, to Nippon Electric Co., Ltd. Frame synchronizing system for TDMA radio communications. 4,129,755, Cl. 179-15.0BS.

Murakami, Tadayoshi: *See—*
Nakata, Yuichi; and Murakami, Tadayoshi, 4,128,910, Cl. 15-110.000.

Muramatsu, Takao: *See—*
Fujii, Motoharu; Muramatsu, Takao; Koumura, Noboru; Sugiura, Susumu; Takekawa, Nobuhiro; and Tsukada, Syusei, 4,129,072, Cl. 101-1.000.

Murata, Taneo, to Alps Electric Co., Ltd. Push button switch assembly. 4,129,763, Cl. 200-159.00A.

Murayama, Naohiro; Nakamura, Kenichi; and Endo, Shunzo, to Kureha Kagaku Kogyo Kabushiki Kaisha. Multi-component graft copolymer and thermoplastic resin composition thereof. 4,129,608, Cl. 260-836.000.

Muschaweck, Roman: *See—*
Lang, Hans-Jochen; and Muschaweck, Roman, 4,129,656, Cl. 424-263.000.

Musson, Rosemary: *See—*
Dimmick, Joseph G.; Weingartner, William J.; Fields, Alan S.; Fairhead, Donald L.; and Musson, Rosemary, 4,129,087, Cl. 114-144.00E.

Muzzio, John A., to BASF Wyandotte Corporation. Process for the removal of catalyst from polyether polyol. 4,129,718, Cl. 536-4.000.

Nadella: *See—*
Janssen, Pierre A., 4,129,343, Cl. 308-35.000.

Naftulin, Henry. Method and apparatus for defibrination of blood. 4,129,131, Cl. 128-276.000.

Nagahata, Tsutomu: *See—*
Nashiwa, Hajime; Tsuzita, Susumu; and Nagahata, Tsutomu, 4,129,439, Cl. 75-58.000.

Nagai, Haruo; Uehara, Hiroshi; and Nunokawa, Kunikazu, to Kyowa Gas Chemical Industry Co., Ltd. Radiation shielding material and a process for producing the same. 4,129,524, Cl. 252-478.000.

Nagaoka Co. Ltd.: *See—*
Kawabe, Hirokazu; Imai, Kiyoshi; and Miyakoshi, Masanobu, 4,128,909, Cl. 15-104.00A.

Naitou, Takashi: *See—*
Ito, Osamu; Hobo, Nobuhito; Suzuki, Yutaka; Kawamoto, Itsushi; Naitou, Takashi; Shiozaki, Makoto; and Konishi, Yoshimune, 4,129,105, Cl. 123-119.0EC.

Najer, Henry: *See—*
Giudicelli, Don P. R. L.; and Najer, Henry, 4,129,598, Cl. 260-570.80R.

Nakahara, Yasushi; Ohtomo, Tadasuke; Yokota, Shinichi; and Usui, Kazuo, to Kajima Kensetsu Kabushiki Kaisha. Tremie tube. 4,129,008, Cl. 405-303.000.

Nakajima, Masayasu: *See—*
Suzuki, Suzuo; Nakajima, Masayasu; Koizumi, Ken-ichi; and Ookubo, Yoshio, 4,128,997, Cl. 60-274.000.

Nakamichi, Koichi: *See—*
Inoue, Sho; Kawamata, Masanobu; Ushimaru, Hirokazu; Nakamichi, Koichi; and Takahashi, Yutaka, 4,129,649, Cl. 424-182.000.

Nakamura, Akira: *See—*
Takematsu, Tetsuo; Masuda, Fusayoshi; Tanaka, Kenji; Nishida, Kazuo; and Nakamura, Akira, 4,129,435, Cl. 71-65.000.

Nakamura, Kenichi: *See—*
Murayama, Naohiro; Nakamura, Kenichi; and Endo, Shunzo, 4,129,608, Cl. 260-836.000.

Nakamura, Masatatsu: *See—*
Amagami, Keizo; Nakamura, Masatatsu; Kominami, Hideyuki; Funakoshi, Kouji; Kiuchi, Mitsuyuki; and Mizukawa, Takumi, 4,129,767, Cl. 219-10.49R.

Nakamura, Masayoshi: *See—*
Ogoshi, Toshiaki; Nakamura, Masayoshi; and Yamane, Izumi, 4,129,511, Cl. 252-140.000.
Ogoshi, Toshiaki; Nakamura, Masayoshi; and Yazaki, Mituyoshi, 4,129,526, Cl. 252-536.000.

Nakao, Manabu: *See—*
Kobayashi, Kengo; Mogami, Masayuki; Tanaka, Shigeyoshi; Nakao, Manabu; and Tamura, Sadao, 4,129,610, Cl. 260-837.00R.

Nakase, Takamichi: *See—*
Hattori, Tadashi; Nakase, Takamichi; Tsubouchi, Hideo; and Iwata, Toshiharu, 4,128,998, Cl. 60-277.000.

Nakata, Yuichi; and Murakami, Tadayoshi, to Pigeon Kabushiki Kaisha. Toothbrush. 4,128,910, Cl. 15-110.000.

Nakayama, Hiroyuki: *See—*
Makuuchi, Keizo; Araki, Kunio; Takagi, Tohru; Nakayama, Hiroyuki; and Kozu, Haruo, 4,129,487, Cl. 204-159.140.

Nametkin, Nikolai S.; Vinogradov, Georgy V.; Podolsky, Jury Y.; Pavlovskaya, Nina T.; Frenkin, Ernest I.; and Yanovsky, Jury G. Self-lubricating heat-resistant material and process for manufacturing same. 4,129,550, Cl. 260-42.220.

Narahara, Toshikazu: *See—*
Karasawa, Yoshiharu; Koyama, Tohru; and Narahara, Toshikazu, 4,129,554, Cl. 528-48.000.

Nashiwa, Hajime; Tsuzita, Susumu; and Nagahata, Tsutomu, to Sumitomo Metal Industries, Ltd. Process for refining molten steel using ferroalloy. 4,129,439, Cl. 75-58.000.

Natarajan, Sehsea I.: *See—*
Ondetti, Miguel A.; and Natarajan, Sehsea I., 4,129,566, Cl. 546-326.000.

National Controls, Inc.: *See—*
Argentine, Jeffery C.; and Minton, Darrell B., 4,129,815, Cl. 318-601.000.

National Distillers and Chemical Corporation: *See—*
Colburn, Samuel E.; Bryant, Duane K.; Platz, Gerald M.; and Vetter, Clarence J., Jr., 4,129,714, Cl. 526-331.000.

National Gypsum Company: *See—*
Nowick, Chester R.; and de Franza, Alfred, 4,129,410, Cl. 432-31.000.

National Research Laboratories: *See—*
Shringarpurey, Sudhir K.; and Maurer, Gerald L., 4,129,509, Cl. 252-49.500.

National Starch and Chemical Corporation: *See—*
Iovine, Carmine P.; and Ray-Chaudhuri, Dilip K., 4,129,722, Cl. 536-43.000.

Natural Resources Guardianship International, Inc.: *See—*
Webb, Harry M., 4,129,421, Cl. 44-56.000.

Navratil, Gerald A.; and Neil, George R., to Wisconsin Alumni Research Foundation. Electrode structures for high energy high temperature plasmas. 4,129,772, Cl. 219-121.00P.

Nawrocki, Adam: *See—*
Biedacha, Roman; Kurdziel, Wladyslaw; Kaczor, Janusz; Smeder, Adam; Kolaczkowski, Jacek; Olszowski, Tadeusz; Nawrocki, Adam; and Rzeszut, Janina, 4,129,169, Cl. 164-166.000.

Neal, Gary W.; and Montgomery, Robert M., to Harris Corporation. Method and means for linearizing a voltage controlled oscillator sweep generator. 4,129,832, Cl. 331-44.000.

Neel, Jean: *See—*
Caffarel, Jean-Claude; Papillon, Bernard; and Neel, Jean, 4,129,514, Cl. 252-89.00R.

Neige, Roger: *See—*
Aubert, Jacques; Carles, Maurice; and Neige, Roger, 4,129,481, Cl. 204-1.500.

Neil, George R.: *See—*
Navratil, Gerald A.; and Neil, George R., 4,129,772, Cl. 219-121.00P.

Neitzel, Ulrich, to Kali & Salz AG. Process for the production of potassium sulfate. 4,129,642, Cl. 423-199.000.

Nelb, Robert G., II: *See—*
Chen, Augustin T.; Farrissey, William J., Jr.; and Nelb, Robert G., II, 4,129,715, Cl. 528-67.000.
Nelson Research & Development Company: *See—*
Fuxe, Kjell, 4,129,652, Cl. 424-247.000.
Nemoto Tokusho Kagaku Kabushiki Kaisha: *See—*
Matsuzawa, Takashi, 4,129,519, Cl. 252-301.40H.
Neuschwander, Jean-Christian: *See—*
El-Souessi, Monti; Laffay, Gilbert; and Neuschwander, Jean-Christian, 4,129,188, Cl. 173-120.000.
Newton, John: *See—*
Mairs, John H., 4,129,012, Cl. 62-113.000.
Nickel, Lonnie L. Sow feeding enclosure. 4,129,096, Cl. 119-27.000.
Nies, Herbert: *See—*
Haberlein, Harald; Nies, Herbert; and Scheidl, Franz, 4,129,553, Cl. 260-45.85R.
Niles, Albert B.; Franzen, Larry H.; Gardner, William J.; and Grob, Russel W., to Caterpillar Tractor Co. Method and apparatus for checking engine performance. 4,129,034, Cl. 73-117.300.
Nippon Electric Co., Ltd.: *See—*
Murakami, Shuji, 4,129,755, Cl. 179-15.0BS.
Nippon Kogaku K.K.: *See—*
Watanabe, Sakuji, 4,129,366, Cl. 354-24.000.
Nippon Shinyaku Co. Ltd.: *See—*
Inoue, Sho; Kawamata, Masanobu; Ushimaru, Hirokazu; Nakamichi, Koichi; and Takahashi, Yutaka, 4,129,649, Cl. 424-182.000.
Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See—*
Awaji, Toshio; and Atobe, Daisuke, 4,129,609, Cl. 260-837.00R.
Nippon Soken, Inc.: *See—*
Hattori, Tadashi; Nakase, Takamichi; Tsubouchi, Hideo; and Iwata, Toshiharu, 4,128,998, Cl. 60-277.000.
Nippon Steel Corporation: *See—*
Miyasita, Satoru; Taniguchi, Masahiko; and Kobayashi, Katsuyoshi, 4,129,289, Cl. 266-195.000.
Nippondenso Co., Ltd.: *See—*
Ito, Osamu; Hobo, Nobuhito; Suzuki, Yutaka; Kawamoto, Itsushi; Naitou, Takashi; Shiozaki, Makoto; and Konishi, Yoshimune, 4,129,105, Cl. 123-119.0EC.
Nishida, Kazuo: *See—*
Takematsu, Tetsuo; Masuda, Fusayoshi; Tanaka, Kenji; Nishida, Kazuo; and Nakamura, Akira, 4,129,435, Cl. 71-65.000.
Nishida, Osamu: *See—*
Hosaka, Nobuyoshi; Ishikawa, Yuichi; Nishida, Osamu; and Sakamoto, Masakatsu, 4,129,337, Cl. 302-2.00R.
Nishida, Tsutomu: *See—*
Taguchi, Kazumasa; Nishida, Tsutomu; Kitajima, Masaharu; Aketa, Kan; Fujita, Isao; Onoda, Mamoru; Imanishi, Nobuyuki; and Watanabe, Ryo, 4,129,437, Cl. 75-5.000.
Nishiura, Taiji; and Shimamura, Kazutomi. Sealing device for coke oven doors. 4,129,307, Cl. 277-34.300.
Nissan Motor Company, Limited: *See—*
Ishikawa, Yoshikazu, 4,129,043, Cl. 74-219.000.
Matsumoto, Junichiro, 4,129,109, Cl. 123-198.00F.
Suzuki, Suzuo; Nakajima, Masayasu; Koizumi, Ken-ichi; and Ookubo, Yoshio, 4,128,997, Cl. 60-274.000.
Tamazawa, Tsuyoshi; Suematsu, Masayasu; and Morita, Hideo, 4,129,622, Cl. 261-39.00A.
Nisshin Flour Milling Co., Ltd.: *See—*
Fukushima, Hideo; and Suzuki, Yoshikuni, 4,129,565, Cl. 546-142.000.
NJM, Inc.: *See—*
White, Rollin T., 4,128,954, Cl. 40-310.000.
NM Uranium, Inc.: *See—*
Stover, Dennis E., 4,129,334, Cl. 299-4.000.
Noguchi, Masaru, to Fuji Photo Film Co., Ltd. Light beam scanner with parallelism error correction. 4,129,355, Cl. 350-6.700.
Nordmark, Mikal. Hydraulic heeling stabilizers. 4,129,310, Cl. 280-6.00H.
Norman, Helge: *See—*
Ekman, Lars; and Norman, Helge, 4,128,904, Cl. 4-185.00L.
Norman, Telfer E. Electrolytic cell for electrowinning of metals. 4,129,494, Cl. 204-268.000.
Norris Industries, Inc.: *See—*
Tibbetts, Willis F., 4,129,268, Cl. 244-3.220.
Northern Telecom Limited: *See—*
Wei, John S. S., 4,129,358, Cl. 350-173.000.
Nossar, Mstislav S.: *See—*
Chaikin, Malcolm; and Nossar, Mstislav S., 4,129,250, Cl. 236-44.00A.
Nowick, Chester R.; and de Franza, Alfred, to National Gypsum Company. Method of drying gypsum wallboard and apparatus therefor. 4,129,410, Cl. 432-31.000.
Noyes, Paul R., to Du Pont de Nemours, E. I., and Company. High solids coating compositions for flexible substrates containing urea-formaldehyde. 4,129,547, Cl. 260-33.40R.
Nunokawa, Kunikazu: *See—*
Nagai, Haruo; Uehara, Hiroshi; and Nunokawa, Kunikazu, 4,129,524, Cl. 252-478.000.
Nyltite Corporation: *See—*
Gould, William, 4,129,060, Cl. 85-53.000.
Nystrom, Bror E. Systems for supplying treatment liquids to rotatable electroplating drums. 4,129,138, Cl. 134-145.000.
Oberholtzer, Larry W.: *See—*
Maglecic, Steve C.; and Oberholtzer, Larry W., 4,129,189, Cl. 177-123.000.
Obiaya, Joseph O. Oxygen concentration analyzer. 4,129,491, Cl. 204-195.00S.
Occidental Petroleum Corporation: *See—*
Garrett, Donald E., 4,129,440, Cl. 75-63.000.
Ochiai, Hirokazu: *See—*
Saikawa, Isamu; Takano, Shuntaro; Imaizumi, Hiroyuki; Takakura, Isamu; Ochiai, Hirokazu; Yasuda, Takashi; Taki, Hideo; Tai, Masaru; and Kodama, Yutaka, 4,129,730, Cl. 544-21.000.
O'Connor, Michael N. D.: *See—*
Panzer, Hans P.; O'Connor, Michael N. D.; and Baccei, Louis J., 4,129,532, Cl. 526-75.000.
Oestreich, Ulrich, to Siemens Aktiengesellschaft. Optical transmission element having protective jacket to reduce attenuation. 4,129,356, Cl. 350-96.230.
Ogasawara, Toyotsugu, to Tomy Kogyo Co., Inc. Transfer mechanism intended for use in toys. 4,128,964, Cl. 46-43.000.
Ogata, Masatsugu: *See—*
Seki, Masatoshi; Sato, Moriichi; Tsukioka, Hideo; Ohe, Etuo; Ogata, Masatsugu; and Mitsuoka, Akio, 4,129,678, Cl. 428-383.000.
Ogoshi, Toshiaki; Nakamura, Masayoshi; and Yamane, Izumi, to Lion Fat & Oil Co., Ltd., The. Method of spray drying detergents containing aluminosilicates. 4,129,511, Cl. 252-140.000.
Ogoshi, Toshiaki; Nakamura, Masayoshi; and Yazaki, Mituyoshi, to Lion Fat & Oil Co., Ltd., The. Granular detergent compositions and a process for producing same. 4,129,526, Cl. 252-536.000.
Ogrisek, Harriet H.; and Egger, Kurt. Optical system for electrostatic copiers. 4,129,379, Cl. 355-57.000.
Ogura, Yukio; and Fukuda, Mitsuhisa, to Ricoh Company, Ltd. Electrophotographic apparatus. 4,129,373, Cl. 355-1.000.
Ohe, Etuo: *See—*
Seki, Masatoshi; Sato, Moriichi; Tsukioka, Hideo; Ohe, Etuo; Ogata, Masatsugu; and Mitsuoka, Akio, 4,129,678, Cl. 428-383.000.
Ohkita, Masao; and Sato, Hidetoshi, to Alps Electric Co., Ltd. Push switch. 4,129,764, Cl. 200-159.00R.
Ohrstedt, Charles L. Light-diverting attachment for photographic flash units. 4,129,898, Cl. 362-7.000.
Ohtomo, Tadasuke: *See—*
Nakahara, Yasushi; Ohtomo, Tadasuke; Yokota, Shinichi; and Usui, Kazuo, 4,129,008, Cl. 405-303.000.
Oishi, Yoshihiro, to Aida Engineering, Ltd. Anti-overrun device for the slide in a press. 4,129,071, Cl. 100-53.000.
Oka, Minori: *See—*
Inoue, Akira; and Oka, Minori, 4,129,778, Cl. 250-272.000.
Okabe, Katsuhiko, to Copal Company Limited. Line printer. 4,129,075, Cl. 101-99.000.
Okutomi, Tsutomu; Yoshino, Hisashi; and Chiba, Seishi, to Tokyo Shibaura Electric Co., Ltd. Vacuum circuit breaker. 4,129,760, Cl. 200-144.00B.
Okutomi, Tsutomu; Yoshino, Hisashi; Chiba, Seishi; Tsutsumi, Tadahito; and Tejima, Kouichi, to Tokyo Shibaura Electric Co., Ltd. Vacuum circuit breaker. 4,129,761, Cl. 200-144.00B.
Olson, Carl B.; Weisner, Carl S.; and Parker, Phillip H., to Chevron Research Company. Method for extruding slitting and fibrillating thermoplastic film tapes. 4,129,632, Cl. 264-40.100.
Olson, Dean A., Sr., to Rockford Acromatic Products Co. Universal joint cross. 4,129,016, Cl. 64-17.00A.
Olson, Richard O.: *See—*
Pohto, Gerald R.; and Olson, Richard O., 4,129,292, Cl. 269-126.000.
Olszowski, Tadeusz: *See—*
Biedacha, Roman; Kurdziel, Wladyslaw; Kaczor, Janusz; Smeder, Adam; Kolaczkowski, Jacek; Olszowski, Tadeusz; Nawrocki, Adam; and Rzeszut, Janina, 4,129,169, Cl. 164-166.000.
O'Meara, Thomas R., to Hughes Aircraft Company. Glint capture system for improving lock stability of coat. 4,129,775, Cl. 250-203.00R.
Omron Tateisi Electronics Co.: *See—*
Sato, Ryuichi, 4,129,791, Cl. 307-252.00Q.
Ondetti, Miguel A.; and Natarajan, Sehsea I., to E. R. Squibb & Sons, Inc. Derivatives of dehydrocyclicimino acids. 4,129,566, Cl. 546-326.000.
Ondetti, Miguel A.; and Condon, Michael E., to E. R. Squibb & Sons, Inc. Amino acid derivatives. 4,129,571, Cl. 260-326.200.
O'Neil, Theodore K.; and Spector, George. Ecology pop-in container top. 4,129,227, Cl. 220-267.000.
Ong, Jose K. Guide and adaptor for hand saws. 4,128,940, Cl. 30-373.000.
Onoda, Mamoru: *See—*
Taguchi, Kazumasa; Nishida, Tsutomu; Kitajima, Masaharu; Aketa, Kan; Fujita, Isao; Onoda, Mamoru; Imanishi, Nobuyuki; and Watanabe, Ryo, 4,129,437, Cl. 75-5.000.
Ookubo, Yoshio: *See—*
Suzuki, Suzuo; Nakajima, Masayasu; Koizumi, Ken-ichi; and Ookubo, Yoshio, 4,128,997, Cl. 60-274.000.
Oostvogels, Franciscus M. P.: *See—*
Vrenken, Louis E.; Oostvogels, Franciscus M. P.; and van der Wolf, Rein W., 4,129,802, Cl. 313-492.000.
Ortho Pharmaceutical Corporation: *See—*
Bandurco, Victor T.; and Levine, Seymour, 4,129,653, Cl. 424-251.000.
Osborn Manufacturing Company, The: *See—*
Hatch, Edmond K., 4,129,208, Cl. 198-626.000.
Osborn Manufacturing Corporation, The: *See—*
Charvat, Vernon K., 4,128,972, Cl. 51-298.00R.

Otake, Minoru: *See*—
Inano, Tozaburo; Yamazaki, Katsuhiro; and Otake, Minoru, 4,129,774, Cl. 219-552.000.
Otterbach, Paul M. System for determining the level of heat treatment. 4,129,033, Cl. 73-772.000.
Overton Company: *See*—
Rustin, Rudolph B., Jr.; and Bales, O. Sherman, 4,129,246, Cl. 229-23.00R.
Owen, John A., to Montreal Engineering Company, Limited. Tunnel. 4,129,010, Cl. 405-169.000.
Owens-Illinois, Inc.: *See*—
Bailey, Edward L., 4,129,225, Cl. 215-12.00R.
Oyama, Testuo: *See*—
Soeno, Ko; Iizuka, Tomio; Doi, Toshio; Ando, Hisashi; Oyama, Testuo; Sakamoto, Hiroshi; and Misumi, Akira, 4,129,801, Cl. 313-346.00R.
Pacific Roller Die Co., Inc.: *See*—
Davis, Paul K., 4,129,152, Cl. 138-154.000.
Package Machinery Company: *See*—
Simmons, Charles J., 4,128,985, Cl. 53-51.000.
Paidoussis, Michael P. Marine propulsion apparatus. 4,129,089, Cl. 115-28.00A.
Pak, Sung K.: *See*—
Marshall, Robert M.; Pak, Sung K.; and Dardoufas, Kimon C., 4,129,507, Cl. 252-8.900.
Palma, Florencio N. Double wind turbine with four function blade set. 4,129,787, Cl. 217-55.000.
Panduit Corp.: *See*—
Bulanda, John J.; Guzay, Casimir M.; and Betitschke, Bruce A., 4,128,919, Cl. 24-20.0TT.
Panzer, Hans P.; O'Connor, Michael N. D.; and Baccei, Louis J., to American Cyanamid Company. Method of preparing imidozoline and tetrahydro pyrimidine polymers. 4,129,532, Cl. 526-75.000.
Papayoanou, Aristotle, to United States of America, Army. Frequency stable boron nitride channel laser. 4,129,836, Cl. 331-94.50D.
Papillon, Bernard: *See*—
Caffarel, Jean-Claude; Papillon, Bernard; and Neel, Jean, 4,129,514, Cl. 252-89.00R.
Papst, Georg, to Papst-Motoren KG. Stator winding mounting for an electric motor. 4,129,796, Cl. 310-43.000.
Papst-Motoren KG: *See*—
Papst, Georg, 4,129,796, Cl. 310-43.000.
Parisot, Jacques: *See*—
Vinner, Robert E.; Parisot, Max; and Parisot, Jacques, 4,129,083, Cl. 112-178.000.
Parisot, Max: *See*—
Vinner, Robert E.; Parisot, Max; and Parisot, Jacques, 4,129,083, Cl. 112-178.000.
Park, Anthony J.; and Sturt, Alan C., to BP Chemicals International Limited. Polymers modified by sulfosuccinae esters. 4,129,698, Cl. 526-3.000.
Park, Chung P.; Corbett, John M.; and Griffin, Warren H., to Dow Chemical Company, The. Soft ethylenic polymer foams. 4,129,530, Cl. 521-79.000.
Parker, Phillip H.: *See*—
Olson, Carl B.; Weisner, Carl S.; and Parker, Phillip H., 4,129,632, Cl. 264-40.100.
Parker, William H., to Del Norte Technology, Inc. Downhole valve which may be installed or removed by a wireline running tool. 4,129,184, Cl. 166-315.000.
Pasero, Regine: *See*—
Viout, Andre; and Pasero, Regine, 4,129,711, Cl. 526-286.000.
Pastorino, Ronald L.: *See*—
Lewis, Roger N.; Pastorino, Ronald L.; and Wilts, James F., 4,129,613, Cl. 260-861.000.
Patsch, Manfred; and Hettche, Albert, to BASF Aktiengesellschaft. Pyrazoline compounds. 4,129,563, Cl. 260-239.900.
Pauwels, Edward M., to Bendix Corporation, The. Modulator valve assembly for a fluid braking system. 4,129,341, Cl. 303-6.00R.
Pavlovskaya, Nina T.: *See*—
Nametkin, Nikolai S.; Vinogradov, Georgy V.; Podolsky, Jury Y.; Pavlovskaya, Nina T.; Frenkin, Ernest I.; and Yanovsky, Jury G., 4,129,550, Cl. 260-42.220.
Pavonet, Wilhelm E., to Societe de Prayon. Iron oxide based pigment and process for preparing such a pigment. 4,129,454, Cl. 106-304.000.
Pawling, Paul G.: *See*—
Cecka, Andrew M.; Dano, Pol; and Pawling, Paul G., 4,129,634, Cl. 264-45.300.
Payer, Wolfgang: *See*—
Hobes, John; and Payer, Wolfgang, 4,129,472, Cl. 156-331.000.
Payne, Peter R., to Payne, Sylvia M., a part interest. Modular erosion control system. 4,129,006, Cl. 405-31.000.
Payne, Sylvia M.: *See*—
Payne, Peter R., 4,129,006, Cl. 405-31.000.
Pearson, James E. Emergency door opening device. 4,129,811, Cl. 318-478.000.
Pellant, Michal: *See*—
Reichel, Pavel; Kafunek, Pavel; Kovar, Jiri; Pokorny, Oldrich; Zuna, Jaroslav; Kratina, Jindrich; and Pellant, Michal, 4,129,881, Cl. 357-82.000.
Pennwalt Corporation: *See*—
Kamath, Vasanth R.; and Harpell, Gary A., 4,129,703, Cl. 526-73.000.
Mageli, Orville L.; and Swarts, William A., 4,129,700, Cl. 260-823.000.
Rauer, Kurt; Hofmann, Harald; Schiller, Heidelinde; and Sheppard, Chester S., 4,129,531, Cl. 521-94.000.
Reifenberg, Gerald H., 4,129,584, Cl. 260-429.700.
Sanchez, Jose, 4,129,704, Cl. 526-73.000.
Sheppard, Chester S.; and MacLeay, Ronald E., 4,129,586, Cl. 260-465.00D.
Pepper, William, Jr., to Peptek, Inc. Human-machine interface apparatus. 4,129,747, Cl. 178-19.000.
Peptek, Inc.: *See*—
Pepper, William, Jr., 4,129,747, Cl. 178-19.000.
Perard, Jean-Claude V., to Societe Francaise d'Equipements pour la Navigation Aerienne (S.F.E.N.A.). Power jack incorporating stress-responsive components. 4,129,049, Cl. 74-625.000.
Percival, Stephen J., to Johnsen & Jorgensen (Plastics) Ltd. Hinged closures for containers. 4,129,226, Cl. 215-235.000.
Perez, Africa P. Compound manual toothbrush. 4,128,911, Cl. 15-167.00R.
Perkin-Elmer Corporation, The: *See*—
Jones, Robert A., 4,128,968, Cl. 51-54.000.
Peroutky, Donald C.: *See*—
Bigelow, John E.; and Peroutky, Donald C., 4,129,390, Cl. 400-121.000.
Perret, Jean Y. Apparatus for the automatic labelling of objects of differing shapes. 4,129,473, Cl. 156-364.000.
Pesson, Marcel, to Laboratoire Roger Bellon. Process for the preparation of an 8-alkyl-5-oxo-5,8-dihydro-pyrido(2,3-d)pyrimidine-6-carboxylic acid. 4,129,737, Cl. 544-279.000.
Peters, Edwin F.: *See*—
Jezl, James L.; and Peters, Edwin F., 4,129,701, Cl. 526-65.000.
Peters, Kenneth: *See*—
King, Walter J.; Snook, James C.; and Peters, Kenneth, 4,129,692, Cl. 429-234.000.
Peterson, Anders A.; and Catlin, Francis D., to Hardinge Brothers, Inc. Bar stock feed apparatus. 4,129,220, Cl. 214-1.400.
Peterson, Donald J., to Procter & Gamble Company, The. Energy saving detergent manufacture. 4,129,516, Cl. 252-122.000.
Peterson, Donald J., to Procter & Gamble Company, The. Soap making. 4,129,520, Cl. 252-367.000.
Peterson, Richard H.: *See*—
Jensen, Richard W.; and Peterson, Richard H., 4,129,056, Cl. 84-1.260.
Petrolite Corporation: *See*—
Thompson, Neil E. S., 4,129,597, Cl. 260-563.00P.
Petrovich, John P.; and Van Eenam, Donald N., to Monsanto Company. Polyamine-epihalohydrin resinous reaction products. 4,129,528, Cl. 260-823.000.
Pfaffle, Ernst, to Ricoh Company, Ltd. Method and construction for spiral wire binding of pads. 4,129,156, Cl. 140-92.400.
Pfizer Inc.: *See*—
Barth, Wayne E., 4,129,732, Cl. 544-23.000.
Celmer, Walter D.; Cullen, Walter P.; Jefferson, Mark T.; Moppett, Charles E.; Routien, John B.; and Sciavolino, Frank C., 4,129,578, Cl. 260-345.70R.
Kuhla, Donald E., 4,129,567, Cl. 546-121.000.
Plattner, Jacob J., 4,129,728, Cl. 542-429.000.
Philip Morris Incorporated: *See*—
Hind, John D.; and Hopkins, William C., 4,129,134, Cl. 131-2.000.
Phillips, James D. Tool load sensor and control circuit. 4,129,789, Cl. 307-118.000.
Phillips Petroleum Company: *See*—
Marrs, Oren L.; and Reusser, Robert E., 4,129,541, Cl. 260-28.5AS.
Scott, John N., Jr.; and Carrow, Guy E., 4,129,282, Cl. 249-137.000.
Selman, Charles M.; and Uraneck, Carl A., 4,129,558, Cl. 260-823.000.
Tabler, Donald C.; and Johnson, Marvin M., 4,129,605, Cl. 260-669.00A.
Phillips, Velma L. Multiple purpose teaching device. 4,128,990, Cl. 58-2.000.
Pichl, Heinz, to AB Volvo Penta. Module unit. 4,129,103, Cl. 123-52.00R.
Pickering & Company, Inc.: *See*—
Wittenberg, Roland C., 4,129,305, Cl. 274-23.00R.
Pierce, William C.; Berry, Samuel M.; and Johnson, Arthur D., to Pitts Industries, Inc. Method of making a pulley groove. 4,129,026, Cl. 72-367.000.
Pierrel, Michel; and Malivoir, Roger, to Pont-a-Mousson S.A. Installation for handling socket cores for a centrifugal casting machine. 4,129,171, Cl. 164-292.000.
Pigeon Kabushiki Kaisha: *See*—
Nakata, Yuichi; and Murakami, Tadayoshi, 4,128,910, Cl. 15-110.000.
Pigerol, Charles; de Cointet de Fillain, Paul; and Bazile, Yves, to Labaz. Phenyl-2 indole derivatives. 4,129,572, Cl. 260-326.12R.
Pignato, Gaetano. Dual gauge indicating device. 4,129,039, Cl. 73-310.000.
Pinettes, Jacques; and Chaix, Jean, to Alliages Frittes S.A. Method for butt-welding cylindrical metallic rods. 4,129,771, Cl. 219-104.000.
Pinto, Frank G.: *See*—
Kaplan, Earl; and Pinto, Frank G., 4,129,538, Cl. 260-23.70M.
Pisanchyn, John: *See*—
Baker, Josefina T.; Pisanchyn, John; and Sifniades, Stylianos, 4,129,594, Cl. 260-544.00D.
Pitkanen, Alan R.: *See*—
Marason, Gabriel, Jr.; Melzian, John M.; and Pitkanen, Alan R., 4,128,949, Cl. 35-39.000.

Pitney-Bowes, Inc.: *See*—
Kanning, L. Neil, 4,129,191, Cl. 177-210.00R.

Pitts Industries, Inc.: *See*—
Pierce, William C.; Berry, Samuel M.; and Johnson, Arthur D., 4,129,026, Cl. 72-367.000.

Pizzuti, Donato F., to Polaroid Corporation. Electromagnet controlled scanning shutter blade arrangement. 4,129,371, Cl. 354-234.000.

Platt, Clark I., to Whirlpool Corporation. One-piece agitator with clothes lifting cams. 4,129,018, Cl. 68-134.000.

Plattner, Jacob J., to Pfizer Inc. 2-(Descarboxy)-2-(tetrazol-5-yl) 11-desoxy-15-thiaprostaglandins. 4,129,728, Cl. 542-429.000.

Platz, Gerald M.: *See*—
Colburn, Samuel E.; Bryant, Duane K.; Platz, Gerald M.; and Vetter, Clarence J., Jr., 4,129,714, Cl. 526-331.000.

Platz, Winfried: *See*—
Tschunt, Edgar; Platz, Winfried; Bar, Ulrich; and Heinz, Lothar, 4,129,784, Cl. 250-505.000.

Plessey Handel und Investments AG: *See*—
Dickson, John F.; and Wilcock, John D., 4,129,794, Cl. 307-270.000.

Pletka, Hans-Dieter: *See*—
Buder, Wolfgang; Pletka, Hans-Dieter; Michel, Rudolf; Schwarz, Rudolf; and Dusing, Gerhard, 4,129,585, Cl. 260-448.80R.

Plumat, Emile; and Posset, Robert, to Glaverbell. Process for forming a metal oxide coating. 4,129,434, Cl. 65-60.00D.

Podgorski, Jan, to INTERATOM, International Atomreaktorbau GmbH. Electroacoustic transducer with a magnetostrictive core. 4,129,851, Cl. 340-11.000.

Podolsky, Jury Y.: *See*—
Nametkin, Nikolai S.; Vinogradov, Georgy V.; Podolsky, Jury Y.; Pavlovskaya, Nina T.; Frenkin, Ernest I.; and Yanovsky, Jury G., 4,129,550, Cl. 260-42.220.

Pohto, Gerald R.; and Olson, Richard O., to Diamond Shamrock Corporation. Electrode sheet assembly apparatus. 4,129,292, Cl. 269-126.000.

Pokorny, Oldrich: *See*—
Reichel, Pavel; Kafunek, Pavel; Kovar, Jiri; Pokorny, Oldrich; Zuna, Jaroslav; Kratina, Jindrich; and Pellant, Michal, 4,129,881, Cl. 357-82.000.

Polanin, Walter R., to AMSTED Industries Incorporated. Railway car coupler. 4,129,219, Cl. 213-100.00R.

Polaroid Corporation: *See*—
Pizzuti, Donato F., 4,129,371, Cl. 354-234.000.
Whiteside, George D., 4,129,367, Cl. 354-83.000.
Whiteside, George D.; and Johnson, Bruce K., 4,129,368, Cl. 354-128.000.

Polimine, Robert F., to General Signal Corporation. Bus bar clamp. 4,129,354, Cl. 339-265.00F.

Polychrome Corporation: *See*—
Deutsch, Albert A.; Dennis, Richard; and Gumbinner, Robert, 4,129,486, Cl. 204-159.190.

Pont-a-Mousson S.A.: *See*—
Pierrel, Michel; and Malivoir, Roger, 4,129,171, Cl. 164-292.000.

Poppe, Richard L.: *See*—
Childress, David L.; Hayes, William V.; and Poppe, Richard L., 4,129,600, Cl. 260-604.00R.

Popper Engineering Ltd.: *See*—
Popper, Jakhin B., 4,129,290, Cl. 267-160.000.

Popper, Jakhin B., to Popper Engineering Ltd. Compression and tension spring. 4,129,290, Cl. 267-160.000.

Portinari, Antonio; and Lavezzari, Piero, to Industrie Pirelli Societa per Azioni. Method for impregnating stranded wires during stranding thereof. 4,129,466, Cl. 156-48.000.

Posset, Robert: *See*—
Plumat, Emile; and Posset, Robert, 4,129,434, Cl. 65-60.00D.

Pouring, Andrew A. Method and apparatus for production of seeding materials. 4,129,252, Cl. 239-2.00R.

Powers, Betsy K. Baby gazebo. 4,129,139, Cl. 135-3.00E.

PPG Industries, Inc.: *See*—
Christenson, Roger M.; Dowbenko, Rostyslaw; and Makhlouf, Joseph M., 4,129,489, Cl. 204-159.220.
Schimmel, Karl F., 4,129,490, Cl. 204-181.00C.

Praetorius, Heinz; Seibert, Karl; and Holtvoigt, Werner, to Akzona Incorporated. Lubricants used in the processing of plastics. 4,129,717, Cl. 528-421.000.

Precision Handling Devices, Inc.: *See*—
Hubbard, Leo J., 4,129,239, Cl. 226-75.000.

Presby, Herman M.: *See*—
Jaeger, Raymond E.; and Presby, Herman M., 4,129,433, Cl. 65-2.000.

Pressman, Berton C.; and deGuzman, Norberto T., to University of Miami, The. Method for improving cardiovascular function with salinomycin. 4,129,659, Cl. 424-283.000.

Preston, John C. Safety-catch scaffolding system. 4,129,197, Cl. 182-82.000.

Price, Reginald S. Suspension assembly for partition panel. 4,128,979, Cl. 52-241.000.

Pritchard, Clyde L.: *See*—
Mott, Richard H.; and Pritchard, Clyde L., 4,129,258, Cl. 239-650.000.

Probst, Wallace P., to Robil Company. Bundle carrier attachment for fork lift trucks. 4,129,223, Cl. 214-620.000.

Procter & Gamble Company, The: *See*—
Foster, Gregory S., 4,129,515, Cl. 252-117.000.
Peterson, Donald J., 4,129,516, Cl. 252-122.000.
Peterson, Donald J., 4,129,520, Cl. 252-367.000.
Ritze, Lyle W., 4,129,638, Cl. 264-117.000.

Proctor, Dale D.: *See*—
Cofer, Daniel B.; Ward, George C.; and Proctor, Dale D., 4,129,170, Cl. 164-270.000.

Promotion Etude Conditionnement d'Articles de Mercerie - PECAM Internat.: *See*—
Schick, Henri, 4,129,216, Cl. 211-13.000.

Pruski, Edward M.: *See*—
Tehon, Stephen W.; and Pruski, Edward M., 4,129,031, Cl. 73-32.00A.

Przedsicbiorstwo Projektowania I Realizacji Inwestycji przemyslu Maszynowego "Bipromasz", Instytut Odlewnictwa: *See*—
Biedacha, Roman; Kurdziel, Wladyslaw; Kaczor, Janusz; Smeder, Adam; Kolaczkowski, Jacek; Olszowski, Tadeusz; Nawrocki, Adam; and Rzeszut, Janina, 4,129,169, Cl. 164-166.000.

Puls, James H.: *See*—
Wied, George L.; Bahr, Gunter F.; and Puls, James H., 4,129,381, Cl. 356-36.000.

Punte, Lawrence F.: *See*—
Stewart, Walter P.; and Punte, Lawrence F., 4,129,682, Cl. 428-571.000.

Q Corporation: *See*—
Smith, E. Quimby, Jr., 4,129,003, Cl. 60-645.000.

Quest Automation Limited: *See*—
Lambden, Martin R., 4,129,746, Cl. 178-18.000.

Quick, Donald J., to Massey-Ferguson Services N.V. Trash removal apparatus for sugar cane harvesters. 4,129,339, Cl. 302-21.000.

Quintana, Roberto. Traction device for tires. 4,129,161, Cl. 152-225.00R.

R. Alkan & Cie: *See*—
Hasquenoph, Jean H.; and Coutin, Pierre F., 4,129,271, Cl. 244-137.00R.

R. J. Reynolds Tobacco Company: *See*—
Harris, James L., 4,129,427, Cl. 55-247.000.

Racine, Philippe; Higelin, Jean-Claude; Engelhardt, Roland; and Mindt, Wolfgang, to Hoffmann-La Roche Inc. Method for measuring substrate concentrations. 4,129,478, Cl. 204-1.00T.

Ragan, Ralph L. Apparatus for twisting and winding strand material. 4,128,988, Cl. 57-66.000.

Ragle, Herbert U.; and DeMoss, Dean, to Burroughs Corporation. Double partitioning of flexible disk pack and associated apparatus. 4,129,891, Cl. 360-98.000.

Ram-Trol, Inc.: *See*—
Foley, John D., Jr., 4,129,088, Cl. 115-18.00E.

Randall, Geoffrey L. P.: *See*—
Roberts, Philip D.; Randall, Geoffrey L. P.; Simon, David G.; and Booth, Jeffrey, 4,129,702, Cl. 526-71.000.

Randall, Lawrence. Alarm circuit for a door lock. 4,129,865, Cl. 340-542.000.

Rank Xerox Limited: *See*—
Kapoor, Devinder S., 4,129,136, Cl. 134-2.000.

Rashid, Moinuddin S., to General Motors Corporation. Formable high strength low alloy steel. 4,129,461, Cl. 148-12.300.

Rattin, Luciano; and Guelfo, Roberto, to Ing. C. Olivetti & C., S.p.A. Electrophotographic copying machine having a masking device for different copy sheet formats. 4,129,378, Cl. 355-14.000.

Rauer, Kurt; Hofmann, Harald; Schiller, Heidelinde; and Sheppard, Chester S., to Pennwalt Corporation. Crosslinking of polymers with azo-esters. 4,129,531, Cl. 521-94.000.

Rausch, Paul G., to Celtite, Inc. Anchor device for resin anchor system. 4,129,007, Cl. 405-261.000.

Rauwendaal, Christiaan J., to Akzona Incorporated. Extrusion apparatus. 4,129,386, Cl. 366-88.000.

Ravault, Frank E. G.: *See*—
Jeffreys, Godfrey V.; Mumford, Clive J.; Ravault, Frank E. G.; and Washbourne, Colin, 4,129,500, Cl. 210-23.00R.

Ray-Chaudhuri, Dilip K.: *See*—
Iovine, Carmine P.; and Ray-Chaudhuri, Dilip K., 4,129,722, Cl. 536-43.000.

Raychem Corporation: *See*—
Zingheim, Steven C., 4,129,616, Cl. 260-878.00R.

Raymonda, John W.: *See*—
Daiber, John W.; and Raymonda, John W., 4,129,835, Cl. 331-94.50G.

Raytheon Company: *See*—
Frank, Robert I.; and Salzer, Thomas E., 4,129,848, Cl. 338-308.000.
Galani, Zvi; and Temple, Steven J., 4,129,839, Cl. 333-9.000.
Mumper, James E., 4,129,850, Cl. 340-10.000.

Raz, Zeev. Toilet-bowl flush system and devices therefor. 4,128,906, Cl. 4-325.000.

RCA Corporation: *See*—
Cunningham, Thomas J.; Schwartzberg, Harold L., deceased; and McGlynn, Joseph L., Jr., executor, 4,129,744, Cl. 174-94.00R.
Haferl, Peter E., 4,129,806, Cl. 315-370.000.
Johns, McKinley R., 4,129,871, Cl. 343-727.000.
Martin, Carl J.; and Ryan, Robert J., 4,129,536, Cl. 260-23.0XA.
Mills, Chester R., 4,129,826, Cl. 324-57.0SS.
Mok, Chuck K., 4,129,840, Cl. 333-73.00W.
Tamutus, Donald J., 4,129,628, Cl. 264-1.000.
Wiesbrod, Sherman, 4,129,804, Cl. 315-169.0TV.

RCA Limited: *See*—
Webb, Paul P., 4,129,878, Cl. 357-13.000.

Redl, Simon: *See*—
Wolfseder, Alfons; Urban, Hans; and Redl, Simon, 4,129,504, Cl. 210-247.000.

Regie Nationale des Usines Renault: *See—*
Lenglet, Henry, 4,129,160, Cl. 141-388.000.
Reich, Fred R.: *See—*
Walker, Ray A.; Reich, Fred R.; and Russell, James T., 4,129,384, Cl. 356-381.000.
Reichel, Pavel; Kafunek, Pavel; Kovar, Jiri; Pokorny, Oldrich; Zuna, Jaroslav; Kratina, Jindrich; and Pellant, Michal, to CKD Praha, oborovy podnik. Heat sink cooled, semiconductor device assembly having liquid metal interface. 4,129,881, Cl. 357-82.000.
Reichelt, Walter: *See—*
Herklotz, Gunther; and Reichelt, Walter, 4,129,765, Cl. 200-268.000.
Reifenberg, Gerald H., to Pennwalt Corporation. Process for preparing dimethyltin dichloride. 4,129,584, Cl. 260-429.700.
Reiland, Peter M. Bacon cooking apparatus. 4,129,067, Cl. 99-391.000.
Reimann, Hans: *See—*
Ganguly, Ashit K.; Girijavallabhan, Viyyoor M.; Sarre, Olga; and Reimann, Hans, 4,129,720, Cl. 536-17.000.
Reinholtz, William H., to General Instrument Corporation. Data recording and/or reproducing system. 4,129,888, Cl. 360-40.000.
Rentzsch, Max: *See—*
Bedall, Hans; and Rentzsch, Max, 4,129,061, Cl. 86-20.00B.
Republic Rubber Industries (Prop.) Ltd.: *See—*
Martin, Aubrey W., 4,129,474, Cl. 156-394.000.
Reusser, Robert E.: *See—*
Marrs, Oren L.; and Reusser, Robert E., 4,129,541. Cl. 260-28.5AS.
Rhone-Poulenc Industries: *See—*
Bonin, Yves, 4,129,695, Cl. 521-108.000.
Caffarel, Jean-Claude; Papillon, Bernard; and Neel, Jean, 4,129,514, Cl. 252-89.00R.
Rhone Poulenc Textile: *See—*
Menault, Jacques; and Rodier, Henry, 4,129,451, Cl. 106-168.000.
Rodier, Henry, 4,129,640, Cl. 264-187.000.
Richardson, Dwight; and Richardson, Jerome. Game apparatus. 4,129,298, Cl. 273-100.000.
Richardson, Jerome: *See—*
Richardson, Dwight; and Richardson, Jerome, 4,129,298, Cl. 273-100.000.
Richardsson, Dan. Device for emptying containers or similar. 4,129,222, Cl. 214-17.00D.
Ricoh Company, Ltd.: *See—*
Miyakawa, Seiichi; and Eda, Tadahiro, 4,129,375, Cl. 355-10.000.
Ogura, Yukio; and Fukuda, Mitsuhisa, 4,129,373, Cl. 355-1.000.
Pfaffle, Ernst, 4,129,156, Cl. 140-92.400.
Ridenour, Charles E.; Fabert, Herman A., Jr.; Tasker, John; and Larson, Hugo R., to Abex Corporation. Consumable guide tube assembly. 4,129,773, Cl. 219-146.230.
Riew, Changkiu K., to B. F. Goodrich Company, The. Reaction products of non-cycloaliphatic epoxy resins and amine-terminated liquid polymers and process for preparation thereof. 4,129,670, Cl. 427-386.000.
Riganti, Gian P.: *See—*
Todeschini, Eugenio; and Riganti, Gian P., 4,129,192, Cl. 180-6.480.
Rigenmann, Ludwig. Road surface marking prefabricated tape material, having retroreflective composite elements associated thereto. 4,129,397, Cl. 404-14.000.
Riordan, Joan M.: *See—*
Duke, Edward D.; and Riordan, Joan M., 4,128,952, Cl. 37-8.000.
Ritze, Lyle W., to Procter & Gamble Company, The. Compositions of matter for coloring toothpaste and method of preparing same. 4,129,638, Cl. 264-117.000.
Ritzerfeld, Gerhard. Duplicator machine with means for applying to the copies different markings. 4,129,073, Cl. 101-2.000.
RMI Company: *See—*
Bomberger, Howard B., Jr., 4,129,438, Cl. 75-10.00C.
Robert Bosch GmbH: *See—*
Arendt, Armin, 4,129,819, Cl. 322-28.000.
Robert, Eric. Method and apparatus for determining the immersed surface area of one of the electrodes of an electro-chemical bath. 4,129,480, Cl. 204-1.00T.
Robert-Grandpierre, Jean-Claude, to Ebauches SA. Electronic digital watch. 4,128,991, Cl. 58-23.00R.
Roberts, Philip D.; Randall, Geoffrey L. P.; Simon, David G.; and Booth, Jeffrey, to Imperial Chemical Industries Limited. Polymerizing unsaturated halides with carbamate type metallic catalyst. 4,129,702, Cl. 526-71.000.
Roberts, Thomas G.; Rust, Charles M.; and Witriol, Norman M. Self-aerating container. 4,129,095, Cl. 119-5.000.
Robertshaw Controls Company: *See—*
Teichert, Allen L., 4,129,847, Cl. 337-301.000.
Robil Company: *See—*
Probst, Wallace P., 4,129,223, Cl. 214-620.000.
Robinson, Charles L. Method and apparatus for securing and stabilizing a lightweight, collapsible structure that is moving along a moving work site. 4,128,973, Cl. 52-2.000.
Robinson, Graham: *See—*
Jones, Ivor W.; Robinson, Graham; and Bird, Thomas L., 4,129,690, Cl. 429-104.000.
Robinson, Ronald H.; and Weiland, Richard H., to Boeing Company, The. Air refueling boom pivot gimbal arrangements. 4,129,270, Cl. 244-135.00A.
Rockford Acromatic Products Co.: *See—*
Olson, Dean A., Sr., 4,129,016, Cl. 64-17.00A.
Rodier, Henry, to Rhone Poulenc Textile. Process for producing shaped articles of cellulose. 4,129,640, Cl. 264-187.000.
Rodier, Henry: *See—*
Menault, Jacques; and Rodier, Henry, 4,129,451, Cl. 106-168.000.
Rodrian, James A. Animal identification system. 4,129,855, Cl. 340-152.00T.
Rodway, William G.: *See—*
Downer, John M.; Rodway, William G.; and Shipp, Lawrence S. J., 4,129,618, Cl. 260-884.000.
Rogers, Herbert E., Jr.: *See—*
Dreyer, Dennis G.; Foley, Edward M.; and Rogers, Herbert E., Jr., 4,129,444, Cl. 75-251.000.
Rogerson, Jerry B.; and Harrison, Robert S., to Ford Motor Company. Carburetor with fast idle cam automatic release. 4,129,623, Cl. 261-52.000.
Rohm and Haas Company: *See—*
Cunningham, Virginia L., 4,129,534, Cl. 521-38.000.
Greenfield, Stanley A.; and Dupont, John A., 4,129,448, Cl. 106-15.00R.
Rohweder, Theodore R.: *See—*
Hannes, George J.; Rohweder, Theodore R.; Dreikorn, Hans W.; and Shepherd, Philip B., 4,129,674, Cl. 428-285.000.
Rolff, Klaus-Peter, to Siemens Aktiengesellschaft. Method for the manufacture of contacts for gas-blast circuit breakers. 4,128,936, Cl. 29-630.00R.
Rome, Bernard, to Rome Industries, Inc. Bookbinding technique. 4,129,471, Cl. 156-211.000.
Rome Industries, Inc.: *See—*
Rome, Bernard, 4,129,471, Cl. 156-211.000.
Rosa, John, to Westinghouse Electric Corp. Power factor corrected dual converter motor drive. 4,129,809, Cl. 318-293.000.
Rosch, Gunter: *See—*
Gunther, Dieter; Schinzel, Erich; Erckel, Rudiger; and Rosch, Gunter, 4,129,412, Cl. 8-1.00W.
Rose, David; Weinrich, Erwin; and Lieske, Edgar, to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA). Oxidation hair dyes based upon tetraaminopyrimidine developers and mono- and dialkyl -m-dihydroxy benzene couplers. 4,129,413, Cl. 8-10.200.
Rose, David; Saygin, Ferdi; and Lieske, Edgar, to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA). Oxidation hair colorants containing water-soluble polyhalogen 3-aminophenols as couplers. 4,129,414, Cl. 8-10.200.
Rose Shuffman, executrix u/w Oscar Shuffman, deceased: *See—*
Ross, Sigmund L.; and Shuffman, Oscar, deceased, 4,129,431, Cl. 62-66.000.
Rosencwaig, Allan; and Emary, Robert J., to Gilford Instrument Laboratories. Photoacoustic sample cell. 4,129,385, Cl. 356-244.000.
Rosinski, Louis S., Jr.: *See—*
van der Pool, Kees; Rosinski, Louis S., Jr.; and Belli, Johann B., 4,129,823, Cl. 324-20.00R.
Ross, Leah M. Musical instrument teaching aid. 4,129,058, Cl. 84-485.00R.
Ross, Sigmund L.; and Shuffman, Oscar, deceased, to Rose Shuffman, executrix u/w Oscar Shuffman, deceased. Cryothermal manipulation of petroleum. 4,129,431, Cl. 62-66.000.
Rosvold, Warren C., to Signetics Corporation. Semiconductor transducer packaged assembly. 4,129,042, Cl. 73-727.000.
Roszkowski, Adolph P.; Beard, Colin C.; Dvorak, Charles; and Weinhardt, Klaus, to Syntex (U.S.A.) Inc. 4,5-Dihydro-2-lower alkoxycarbonylamino-4-phenylimidazoles and substituted phenyl derivatives thereof. 4,129,661, Cl. 424-273.00R.
Roth, Michael; and Gogolok, Konrad, to Wacker-Chemie GmbH. Process for the preparation of hydrophobic agents. 4,129,447, Cl. 106-2.000.
Rouquie, Georges, to Bertin & Cie. Method of draining parts emerging from hot galvanizing baths. 4,129,668, Cl. 427-57.000.
Routien, John B.: *See—*
Celmer, Walter D.; Cullen, Walter P.; Jefferson, Mark T.; Moppett, Charles E.; Routien, John B.; and Sciavolino, Frank C., 4,129,578, Cl. 260-345.70R.
Rubin, Fred K., to Lever Brothers Company. Stable liquid abrasive composition suitable for removing manganese-ion derived discolorations from hard surfaces. 4,129,423, Cl. 51-304.000.
Ruble, Ernest B.: *See—*
Czech, James I.; and Ruble, Ernest B., 4,128,935, Cl. 29-596.000.
Ruda, Ernest V.: *See—*
Schneider, Clayton J., Jr.; and Ruda, Ernest V., 4,129,078, Cl. 102-89.0CD.
Ruegg, Andre; and Beck, Wilfried, to Contraves AG. Pivot mechanism. 4,129,280, Cl. 248-183.000.
Rueter, Joern; and Grundamann, Raban, to Chemische Werke Huels Aktiengesellschaft. Flame retardant polyesters. 4,129,551, Cl. 260-45.70R.
Ruge, Hans, to Klaus-Gerd Hoes, Firma. Mounting bars for road making machines. 4,129,399, Cl. 404-118.000.
Ruhrchemie Aktiengesellschaft: *See—*
Hobes, John; and Payer, Wolfgang, 4,129,472, Cl. 156-331.000.
Russell, James T.: *See—*
Walker, Ray A.; Reich, Fred R.; and Russell, James T., 4,129,384, Cl. 356-381.000.
Rust, Charles M.: *See—*
Roberts, Thomas G.; Rust, Charles M.; and Witriol, Norman M., 4,129,095, Cl. 119-5.000.
Rustin, Rudolph B., Jr.; and Bales, O. Sherman, to Overton Company. Shipping carton. 4,129,246, Cl. 229-23.00R.
Ryan, Robert J.: *See—*
Martin, Carl J.; and Ryan, Robert J., 4,129,536, Cl. 260-23.0XA.

Ryugo, Noboru: *See*—
Inaniwa, Keizo; and Ryugo, Noboru, 4,129,090, Cl. 118-49.000.
Rzeszut, Janina: *See*—
Biedacha, Roman; Kurdziel, Wladyslaw; Kaczor, Janusz; Smeder, Adam; Kolaczkowski, Jacek; Olszowski, Tadeusz; Nawrocki, Adam; and Rzeszut, Janina, 4,129,169, Cl. 164-166.000.
Sach, Ernst D.: *See*—
Heinze, Horst; Stierle, Gunter; and Sach, Ernst D., 4,128,921, Cl. 24-279.000.
Saeed, Sheikh A.: *See*—
Collier, Harry O. J.; Saeed, Sheikh A.; Schneider, Cyril; and Mannuzza, Frank, 4,129,648, Cl. 424-101.000.
Saft-Societe des Accumulateurs Fixes et de Traction: *See*—
Broussely, Michel, 4,129,691, Cl. 429-197.000.
Sagara, Seiji: *See*—
Miyamoto, Koichi; Tohyama, Yoshikuni; Sagara, Seiji; Kimura, Yoshimasa; and Ishida, Masato, 4,129,377, Cl. 355-14.000.
Saikawa, Isamu; Takano, Shuntaro; Imaizumi, Hiroyuki; Takakura, Isamu; Ochiai, Hirokazu; Yasuda, Takashi; Taki, Hideo; Tai, Masaru; and Kodama, Yutaka, to Toyama Chemical Co., Ltd. 7α-Methoxycephalosporins. 4,129,730, Cl. 544-21.000.
Sakamoto, Hiroshi: *See*—
Soeno, Ko; Iizuka, Tomio; Doi, Toshio; Ando, Hisashi; Oyama, Testuo; Sakamoto, Hiroshi; and Misumi, Akira, 4,129,801, Cl. 313-346.00R.
Sakamoto, Masakatsu: *See*—
Hosaka, Nobuyoshi; Ishikawa, Yuichi; Nishida, Osamu; and Sakamoto, Masakatsu, 4,129,337, Cl. 302-2.00R.
Sakamoto, Tatsuo: *See*—
Momura, Takao; Umemoto, Yoshiro; and Sakamoto, Tatsuo, 4,129,672, Cl. 428-138.000.
Salmi, Albert E. Ribbon decoration and method of making the same. 4,129,032, Cl. 93-33.00R.
Salzer, Thomas E.: *See*—
Frank, Robert I.; and Salzer, Thomas E., 4,129,848, Cl. 338-308.000.
Sammarone, Dino G., to United States of America, Energy. Environment control system. 4,129,476, Cl. 176-37.000.
Samuel G. Dawson: *See*—
Banke, Kerry O., 4,129,118, Cl. 126-271.000.
Sanchez, Jose, to Pennwalt Corporation. Polymerization of vinyl monomers employing a diperoxyester mixture composition prepared by reacting dihydroperoxide and peroxyester forming carbonyl compounds. 4,129,704, Cl. 526-73.000.
Sandau, Roray J.: *See*—
Goldsby, Claude W.; and Sandau, Roray J., 4,129,251, Cl. 237-51.000.
Sanderson, William A., to United States of America, Agriculture. Selective manufacture of anhydrous modifications of methyl phosphonic acid and use thereof in making pure methyl phosphonic acid and salts thereof. 4,129,588, Cl. 260-502.40P.
Sandoz Ltd.: *See*—
Berthold, Richard, 4,129,658, Cl. 424-274.000.
Santarelli, Mario, to Harvester Center Italiana S.r.l. Apparatus particularly for the automatic harvesting of fruit. 4,128,986, Cl. 56-328.0TS.
Santer, J. Owen: *See*—
Anderson, George J.; Desmond, Timothy F.; and Santer, J. Owen, 4,129,681, Cl. 428-524.000.
Sanwa Industries, Ltd.: *See*—
Kihara, Yoshio, 4,129,084, Cl. 112-221.000.
Sanyo Chemical Industries, Ltd.: *See*—
Takematsu, Tetsuo; Masuda, Fusayoshi; Tanaka, Kenji; Nishida, Kazuo; and Nakamura, Akira, 4,129,435, Cl. 71-65.000.
Sanyo Electric Co., Ltd.: *See*—
Ishii, Yasuhiro; Hirose, Shintaro; and Kawasaki, Ryoichi, 4,129,195, Cl. 181-167.000.
Sanz, Eduardo P. Apparatus for lighting with fluorescent tubes of automatic fixing and connection. 4,129,900, Cl. 362-217.000.
Sardina, John F.: *See*—
Hammond, Howard A.; and Sardina, John F., 4,129,194, Cl. 180-68.500.
Sarns, Inc.: *See*—
Amrine, Bruce A., 4,129,129, Cl. 128-214.00R.
Saroy Engineering: *See*—
Husted, Royce H., 4,129,193, Cl. 180-5.00R.
Sarre, Olga: *See*—
Ganguly, Ashit K.; Girijavallabhan, Viyyoor M.; Sarre, Olga; and Reimann, Hans, 4,129,720, Cl. 536-17.000.
Sasaki, Takehiko: *See*—
Maeda, Hidetoshi; Morihisa, Mitsuo; and Sasaki, Takehiko, 4,128,993, Cl. 58-23.00R.
Sassmannshausen, Gunter: *See*—
Lahme, Norbert; and Sassmannshausen, Gunter, 4,129,687, Cl. 429-86.000.
Sato, Hidetoshi: *See*—
Ohkita, Masao; and Sato, Hidetoshi, 4,129,764, Cl. 200-159.00R.
Sato, Makoto; Takamatsu, Hiroshi; Miyagawa, Yoshitaka; and Fujii, Etsuo, to Honda Giken Kogyo Kabushiki Kaisha. Anti-skid brake control device. 4,129,342, Cl. 303-105.000.
Sato, Moriichi: *See*—
Seki, Masatoshi; Sato, Moriichi; Tsukioka, Hideo; Ohe, Etuo; Ogata, Masatsugu; and Mitsuoka, Akio, 4,129,678, Cl. 428-383.000.
Sato, Nobuo: *See*—
Iwamura, Masahiro; Hamada, Nagaharu; Hara, Toshitaka; and Sato, Nobuo, 4,129,859, Cl. 340-324.0AD.
Sato, Ryuichi, to Omron Tateisi Electronics Co. Solid state switching circuit. 4,129,791, Cl. 307-252.00Q.
Saunders, Norman B. Heating and ventilation system. 4,129,120, Cl. 126-271.000.
Savin Business Machines Corporation: *See*—
Hori, Tatsu; Gardiner, Kenneth W.; and Mangal, Norman F., 4,129,295, Cl. 271-186.000.
Sawrenko, Peter. Hone. 4,128,970, Cl. 51-170.0TL.
Saygin, Ferdi: *See*—
Rose, David; Saygin, Ferdi; and Lieske, Edgar, 4,129,414, Cl. 8-10.200.
Saylor, Richard, to IDR, Inc. Phase locked loop for providing continuous clock phase correction. 4,129,748, Cl. 178-69.100.
Scandia Packaging Machinery Company: *See*—
Anderson, Andrew W.; and Mateyka, Milan, 4,129,205, Cl. 198-358.000.
Scapes, John N.; and Speckmann, Donald R., to Gould Inc. Metering valve. 4,129,284, Cl. 251-205.000.
Schaefer, William F.: *See*—
Spurgin, Anthony J.; and Schaefer, William F., 4,129,475, Cl. 176-22.000.
Schaeffer, Robert L., to General Electric Company. Peeling cutter. 4,128,939, Cl. 30-123.000.
Schapel, Dietmar; and von Gizycki, Ulrich, to Bayer Aktiengesellschaft. Process for the production of thermoformable polyisocyanurate foams. 4,129,697, Cl. 521-176.000.
Scheidl, Franz: *See*—
Haberlein, Harald; Nies, Herbert; and Scheidl, Franz, 4,129,553, Cl. 260-45.85R.
Schering, A.G. Patentabteilung: *See*—
Wiechert, Rudolf; Bittler, Dieter; Kerb, Ulrich; Casals-Stenzel, Jorge; and Losert, Wolfgang, 4,129,564, Cl. 260-239.570.
Schering Corporation: *See*—
Ganguly, Ashit K.; Girijavallabhan, Viyyoor M.; Sarre, Olga; and Reimann, Hans, 4,129,720, Cl. 536-17.000.
Scheurecker, Werner; and Hargassner, Reinhard, to Vereinigte Osterreichische Eisen-und Stahlwerke - Alpine Montan Aktiengesellschaft. Continuous casting plant. 4,129,173, Cl. 164-442.000.
Schick, Henri, to Promotion Etude Conditionnement d'Articles de Mercerie - PECAM Internat. Display stand for sewing-thread spools and like articles. 4,129,216, Cl. 211-13.000.
Schiller, Heidelinde: *See*—
Rauer, Kurt; Hofmann, Harald; Schiller, Heidelinde; and Sheppard, Chester S., 4,129,531, Cl. 521-94.000.
Schimmel, Karl F., to PPG Industries, Inc. Polymeric products. 4,129,490, Cl. 204-181.00C.
Schinzel, Erich: *See*—
Gunther, Dieter; Schinzel, Erich; Erckel, Rudiger; and Rosch, Gunter, 4,129,412, Cl. 8-1.00W.
Schlage Lock Company: *See*—
Urdal, Jan, 4,129,019, Cl. 70-107.000.
Schleich, Hans B., to Etablissement Dentaire Ivoclar. Dental articulator. 4,128,942, Cl. 32-32.000.
Schlumberger Technology Corporation: *See*—
Wahl, John S.; and Schuster, Nick A., 4,129,777, Cl. 250-264.000.
Schmader, Richard W. Metering apparatus for flour and other materials that tend to bridge. 4,129,233, Cl. 222-227.000.
Schmid, Hans, to Meteor AG. Apparatus for the reinforcement of lengths of coil wire. 4,129,158, Cl. 140-149.000.
Schmidt, Ernst M.: *See*—
Van Benthem, Willem; and Schmidt, Ernst M., 4,129,800, Cl. 313-25.000.
Schmidt, Oskar; and Sibral, Walter, to Lim-Holding, S.A. Novel polyethers having terminal amino groups, a process for their production and their application. 4,129,741, Cl. 560-50.000.
Schneider, Clayton J., Jr.; and Ruda, Ernest V., to Calspan Corporation. Dispersive subprojectiles for chaff cartridges. 4,129,078, Cl. 102-89.0CD.
Schneider, Cyril: *See*—
Collier, Harry O. J.; Saeed, Sheikh A.; Schneider, Cyril; and Mannuzza, Frank, 4,129,648, Cl. 424-101.000.
Schnell, Hans G., to Van Kooten B.V. Cylinder piece for a pile driving ram. 4,129,002, Cl. 60-633.000.
Schoelkopf, Walter. Method and apparatus for plastifying and tearing up of damaged road-surfaces and covers. 4,129,398, Cl. 404-95.000.
Scholl, Albert S. Trim guide. 4,128,913, Cl. 15-246.000.
Schrack, Gary L., to Motorola Inc. Multi-pulse modulator for radar transponder. 4,129,867, Cl. 343-6.80R.
Schreck, Robert C.: *See*—
Heyn, Fred M.; Yin, Ching-Feng; Hanson, Gordon L.; and Schreck, Robert C., 4,129,176, Cl. 165-7.000.
Schreiber, William L.; Siano, James N.; and Hall, John B., to International Flavors & Fragrances Inc. Cyclic oxazo derivatives. 4,129,569, Cl. 260-307.0FA.
Schriber, Louis; and Stephens, Robert E., to Harris Corporation. Collating machine with large roll supply. 4,129,293, Cl. 270-52.000.
Schubeis, Ewald I. E. Door frame, especially for fireproof doors. 4,128,977, Cl. 52-212.000.
Schuler, Alan L., to General Dynamics Corporation. Liquefied gas tank and method of filling. 4,129,146, Cl. 137-587.000.
Schulze, Heinz, to Texaco Development Corporation. Urea-aldehyde resins. 4,129,716, Cl. 528-68.000.
Schure, Ralph M.: *See*—
Kooi, John H.; Schure, Ralph M.; and Brown, John M., 4,129,607, Cl. 260-835.000.

Schuster, Nick A.: *See—*
Wahl, John S.; and Schuster, Nick A., 4,129,777, Cl. 250-264.000.
Schwartz, Herbert: *See—*
Egger, Joseph; Mayer, Franz; Schwartz, Herbert; Sodler, Walter; Suard, Jean; and Tilse, Wilhelm, 4,128,992, Cl. 58-23.00D.
Schwartzberg, Harold L., deceased: *See—*
Cunningham, Thomas J.; Schwartzberg, Harold L., deceased; and McGlynn, Joseph L., Jr., executor, 4,129,744, Cl. 174-94.00R.
Schwartzkopff, Udo; and Fischer, Horst, to Akzona Incorporated. Floor covering sheet for stables. 4,129,097, Cl. 119-28.000.
Schwarz, Hans-Dieter. Method and means for the acoustical steering of submarine torpedoes. 4,129,086, Cl. 114-23.000.
Schwarz, Jens P.: *See—*
Glasser, Alan; Schwarz, Jens P.; and Glasser, Lance A., 4,129,112, Cl. 126-121.000.
Schwarz, Rudolf: *See—*
Buder, Wolfgang; Pletka, Hans-Dieter; Michel, Rudolf; Schwarz, Rudolf; and Dusing, Gerhard, 4,129,585, Cl. 260-448.80R.
Schwenk, Walter: *See—*
Leftheris, Basil P.; Mainhardt, Joseph H.; and Schwenk, Walter, 4,129,028, Cl. 72-430.000.
Schwuchow, Norbert, to Daimler-Benz Aktiengesellschaft. Understructure of a self-supporting motor vehicle body. 4,129,330, Cl. 296-28.00F.
Sciavolino, Frank C.: *See—*
Celmer, Walter D.; Cullen, Walter P.; Jefferson, Mark T.; Moppett, Charles E.; Routien, John B.; and Sciavolino, Frank C., 4,129,578, Cl. 260-345.70R.
Sciolotto, Alessandro, to ITW Fastex Italia, Sp.A. Tool for tensioning and cutting self-locking straps. 4,129,157, Cl. 140-123.600.
SCM Corporation: *See—*
McGinniss, Vincent D., 4,129,488, Cl. 204-159.190.
Scott, John N., Jr.; and Carrow, Guy E., to Phillips Petroleum Company. Mold apparatus. 4,129,282, Cl. 249-137.000.
Scott, Paul T., to Du Pont de Nemours, E. I., and Company. Product comprising blend of hollow polyester fiber and crimped polyester binder fiber. 4,129,675, Cl. 428-288.000.
Scott, William B.: *See—*
Brolund, Theodore F.; and Scott, William B., 4,129,460, Cl. 148-9.00R.
Sealed Power Corporation: *See—*
Joseph, A. David, 4,129,503, Cl. 210-232.000.
Sears, Albert W.: *See—*
Shotts, L. D.; Wisbey, Raymond W.; and Sears, Albert W., 4,128,928, Cl. 29-156.80B.
Seibert, Karl: *See—*
Praetorius, Heinz; Seibert, Karl; and Holtvoigt, Werner, 4,129,717, Cl. 528-421.000.
Seifert, Ludwik I.: *See—*
Aversano, Frank J.; Carver, Leon; and Seifert, Ludwik I., 4,129,365, Cl. 353-99.000.
Seki, Masatoshi; Sato, Moriichi; Tsukioka, Hideo; Ohe, Etuo; Ogata, Masatsugu; and Mitsuoka, Akio, to Hitachi, Ltd.; and Hitachi Cable, Ltd. Self-bondable insulated wires comprising three coatings including a phenoxy resin outer layer. 4,129,678, Cl. 428-383.000.
Sellman, Donald L. Vapor lock and fuel vaporization controls. 4,129,106, Cl. 123-136.000.
Sellstedt, John H.; and Klaubert, Dieter H., to American Home Products Corporation. Process for preparing tetrazole-5-carboxamide derivatives. 4,129,735, Cl. 544-132.000.
Selman, Charles M.; and Uraneck, Carl A., to Phillips Pétroleum Company. Preparation of functional polymers. 4,129,558, Cl. 260-823.000.
Sen, Dipankar: *See—*
Jennings, James R.; and Sen, Dipankar, 4,129,587, Cl. 260-465.80D.
Sendlak, Lawrence P., to Hooker Chemicals & Plastics Corp. Liquid phase fluorination process. 4,129,602, Cl. 260-651.00F.
Sensor Technology, Inc.: *See—*
van der Pool, Kees; Rosinski, Louis S., Jr.; and Belli, Johann B., 4,129,823, Cl. 324-20.00R.
Seo, Ryozo: *See—*
Gerstine, Milton I.; Goldberg, Joshua I.; Futatsugi, Setsuo; Ueda, Kazuo; Seo, Ryozo; Iwasaki, Koji; and Uemura, Makoto, 4,129,275, Cl. 244-181.000.
Serini, Volker; Friedhofen, Gerhard; Frietag, Dieter; and Heuser, Jurgen, to Bayer Aktiengesellschaft. 1,1,3,4,6-Pentamethyl-3-(3,5-dimethyl-4-hydroxyphenyl)-indan-5-ol polycarbonates. 4,129,612, Cl. 260-860.000.
Shannon, Montague W. Railroad car for highway trailers. 4,129,079, Cl. 105-368.00B.
Sharp Kabushiki Kaisha: *See—*
Maeda, Hidetoshi; Morihisa, Mitsuo; and Sasaki, Takehiko, 4,128,993, Cl. 58-23.00R.
Takagi, Yutaka; and Toyoda, Munemitsu, 4,129,769, Cl. 219-10.55B.
Uchida, Katsuzo; Uchiyama, Hiroaki; and Mitsuyama, Akira, 4,129,374, Cl. 355-8.000.
Sheathelm, Dorwin J. Bean puller. 4,129,186, Cl. 171-83.000.
Shepherd, Philip B.: *See—*
Hannes, George J.; Rohweder, Theodore R.; Dreikorn, Hans W.; and Shepherd, Philip B., 4,129,674, Cl. 428-285.000.
Sheppard, Chester S.; and MacLeay, Ronald E., to Pennwalt Corporation. Peroxide free radical initiators containing ultraviolet light stabilizing groups. 4,129,586, Cl. 260-465.00D.
Sheppard, Chester S.: *See—*
Rauer, Kurt; Hofmann, Harald; Schiller, Heidelinde; and Sheppard, Chester S., 4,129,531, Cl. 521-94.000.
Sherman, Eli H. Impulse generator for use with phosphor energizable lamps. 4,129,805, Cl. 315-219.000.
Sherritt Gordon Mines Limited: *See—*
Kunda, Wasyl; and Hitesman, Roderick H., 4,129,441, Cl. 75-118.00R.
Shibanov, Mikhail V.: *See—*
Chestnov, Valery F.; and Shibanov, Mikhail V., 4,128,925, Cl. 29-25.200.
Shibata, Toshiji, to Meisei Electric Co. Ltd. Multivibrator. 4,129,833, Cl. 331-66.000.
Shigenobu, Hiromichi; Isobe, Toshiaki; and Kondo, Minoru, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Kabushiki Kaisha Tokai Rika Denki Seisakusho. Electronic timer. 4,129,812, Cl. 318-484.000.
Shih, Martin K. S., to Electrohome Limited. Digital remote control system. 4,129,886, Cl. 358-194.000.
Shikata, Nobuo; and Ito, Sukemitsu, to Agency of Industrial Science & Technology. Method for electrolytic removal of scale from band steel. 4,129,485, Cl. 204-144.500.
Shimada, Tatsuo: *See—*
Yonezawa, Setsuo; Kawakami, Tsuneta; Shimada, Tatsuo; and Chida, Yoshinori, 4,129,860, Cl. 340-324.0AD.
Shimamura, Kazutomi: *See—*
Nishiura, Taiji; and Shimamura, Kazutomi, 4,129,307, Cl. 277-34.300.
Shin-Etsu Chemical Co., Ltd.: *See—*
Kawabe, Hirokazu; Imai, Kiyoshi; and Miyakoshi, Masanobu, 4,128,909, Cl. 15-104.00A.
Shindo, Yoshio; and Ito, Hiroshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Oil pressure control means for an automatic transmission. 4,129,051, Cl. 74-867.000.
Shiozaki, Makoto: *See—*
Ito, Osamu; Hobo, Nobuhito; Suzuki, Yutaka; Kawamoto, Itsushi; Naitou, Takashi; Shiozaki, Makoto; and Konishi, Yoshimune, 4,129,105, Cl. 123-119.0EC.
Shipp, Lawrence S. J.: *See—*
Downer, John M.; Rodway, William G.; and Shipp, Lawrence S. J., 4,129,618, Cl. 260-884.000.
Shneider, David; and Boerman, Lee D. Orthopedic brace for use in treatment of legg perthes disease. 4,129,126, Cl. 128-80.00A.
Shocklee, James L.; and Tayloe, Edward H., to ACF Industries, Inc. Power press guard. 4,129,048, Cl. 74-612.000.
Shotts, L. D.; Wisbey, Raymond W.; and Sears, Albert W., to General Electric Company. Method of forming a curved trailing edge cooling slot. 4,128,928, Cl. 29-156.80B.
Shringarpurey, Sudhir K.; and Maurer, Gerald L., to National Research Laboratories. Metalworking fluid compositions and methods of stabilizing same. 4,129,509, Cl. 252-49.500.
Shuffman, Oscar, deceased: *See—*
Ross, Sigmund L.; and Shuffman, Oscar, deceased, 4,129,431, Cl. 62-66.000.
Shum, Ming S.: *See—*
Janowski, Kenneth R.; Shum, Ming S.; and Bradley, Steven A., 4,129,181, Cl. 165-133.000.
SI Handling Systems, Inc.: *See—*
Brown, William L., 4,129,229, Cl. 221-129.000.
Siano, James N.: *See—*
Schreiber, William L.; Siano, James N.; and Hall, John B., 4,129,569, Cl. 260-307.0FA.
Sibral, Walter: *See—*
Schmidt, Oskar; and Sibral, Walter, 4,129,741, Cl. 560-50.000.
Sickler, Jack R. Scaffold lumber clamps. 4,129,393, Cl. 403-49.000.
Siebert, Gary R., to Gym-Kin Inc. Protective gymnast pants. 4,128,902, Cl. 2-2.000.
Siegl, Herbert: *See—*
Kunstle, Gerhard; Spes, Hellmuth; and Siegl, Herbert, 4,129,596, Cl. 260-561.00K.
Siemens Aktiengesellschaft: *See—*
Bauer, Josef; Krause, Herbert; and Meltsch, Hans-Juergen, 4,128,931, Cl. 29-239.000.
Dahms, Georg; and Kraus, Hubert, 4,128,927, Cl. 29-25.420.
Fink, Helmuth; and Wess, Guenter, 4,129,831, Cl. 324-57.00H.
Gaenge, Friedrich J.; Utner, Ferdinand; Vetter, Harald; and Vilsmeier, Gerhart, 4,128,926, Cl. 29-25.420.
Lindner, Adolf, 4,129,797, Cl. 310-77.000.
Mattern, Alfred, 4,129,750, Cl. 179-15.0AL.
Oestreich, Ulrich, 4,129,356, Cl. 350-96.230.
Rolff, Klaus-Peter, 4,128,936, Cl. 29-630.00R.
Tschunt, Edgar; Platz, Winfried; Bar, Ulrich; and Heinz, Lothar, 4,129,784, Cl. 250-505.000.
Sieurin, Donald, to Morgan Construction Company. Rolling mill. 4,129,023, Cl. 72-235.000.
Sifniades, Stylianos: *See—*
Baker, Josefina T.; Pisanchyn, John; and Sifniades, Stylianos, 4,129,594, Cl. 260-544.00D.
Signetics Corporation: *See—*
Rosvold, Warren C., 4,129,042, Cl. 73-727.000.
Sigsbee, Raymond A., to General Electric Company. $Nb_3Ge$ superconductive films grown with air. 4,129,166, Cl. 164-46.000.
Sigsbee, Raymond A., to General Electric Company. $Nb_3Ge$ superconductive films grown with nitrogen. 4,129,167, Cl. 164-46.000.
Simic, Milutin, to Chevron Research Company. Sulfur composition. 4,129,453, Cl. 106-287.320.
Simmons, Charles J., to Package Machinery Company. Control system for package making machine. 4,128,985, Cl. 53-51.000.

Simon, David G.: *See—*
Roberts, Philip D.; Randall, Geoffrey L. P.; Simon, David G.; and Booth, Jeffrey, 4,129,702, Cl. 526-71.000.
Singer Company, The: *See—*
Hunts, Barney D.; and Waugh, John B. S., 4,129,813, Cl. 318-561.000.
Sjoblum, Urban C. S.: *See—*
Marsh, Gunnar; Henrikssen, Ole; and Sjoblum, Urban C. S., 4,128,903, Cl. 3-19.000.
Sjobom, Axel H., to Sunds Aktiebolag. Device for refining fibrous material. 4,129,263, Cl. 241-248.000.
Skillicorn, Douglas E., to B. F. Goodrich Company, The. Liquid vinylidene terminated polymers. 4,129,713, Cl. 526-320.000.
Slinkard, William E.; and Baylis, Anthony B., to Celanese Corporation. Hydrocarbon oxidation process. 4,129,592, Cl. 562-549.000.
Slusarchyk, William A.; Gordon, Eric M.; and Koster, William H., to E. R. Squibb & Sons, Inc. Process for converting 3-methylene cephalosporins to 3-heterothiomethyl cephalosporins. 4,129,731, Cl. 544-21.000.
Smeder, Adam: *See—*
Biedacha, Roman; Kurdziel, Wladyslaw; Kaczor, Janusz; Smeder, Adam; Kolaczkowski, Jacek; Olszowski, Tadeusz; Nawrocki, Adam; and Rzeszut, Janina, 4,129,169, Cl. 164-166.000.
Smetan, Herbert: *See—*
Kohnert, Hans J.; and Smetan, Herbert, 4,129,309, Cl. 277-189.500.
Smidak, Emil F. Defined space having sound-insulated and light-impermeable walls, preferably intended to enclose a bed. 4,129,123, Cl. 128-1.00R.
Smith, Donald M., to Lubrizol Corporation, The. Sulfur-containing compounds and lubricants and fuels containing them. 4,129,510, Cl. 252-48.600.
Smith, E. Quimby, Jr., to Q Corporation. Engine operated by a non-polluting recyclable fuel. 4,129,003, Cl. 60-645.000.
Smith, Kline & French Laboratories Limited: *See—*
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,129,657, Cl. 424-273.00R.
Smura, Bronislaw B.: *See—*
Fitch, Robert H.; Kurtz, Bruce E.; and Smura, Bronislaw B., 4,129,495, Cl. 204-279.000.
Snap-On Tools Corporation: *See—*
Jindrick, James A., 4,129,828, Cl. 324-16.00S.
Snee, William F., Jr., to Lukens Steel Company. Mold for electroslag remelting process. 4,129,172, Cl. 164-348.000.
Snook, James C.: *See—*
King, Walter J.; Snook, James C.; and Peters, Kenneth, 4,129,692, Cl. 429-234.000.
Snow, Charles L. Filter assembly. 4,129,430, Cl. 55-485.000.
Snow, Marvin. Water fowl decoy. 4,128,958, Cl. 43-3.000.
Snow, Philip B.: *See—*
Telewski, Fred J.; Beeck, Carlos L.; and Snow, Philip B., 4,129,897, Cl. 361-399.000.
Snowden, Paul, to Imperial Chemical Industries Limited. Catalysts containing active metallic copper. 4,129,523, Cl. 252-475.000.
Societe Anonyme dite: UNELEC: *See—*
Bruchet, Michel, 4,129,762, Cl. 200-153.00G.
Societe d'Assistance Technique pour Produits Nestle S.A.: *See—*
Clark, Brian, 4,129,665, Cl. 426-432.000.
Kruseman, Jan; Bertschy, Pierre Y.; and Hidalgo, Jaime, 4,129,664, Cl. 426-7.000.
Societe de Prayon: *See—*
Pavonet, Wilhelm E., 4,129,454, Cl. 106-304.000.
Societe Francaise d'Equipements pour la Navigation Aerienne (S.F.E.N.A.): *See—*
Perard, Jean-Claude V., 4,129,049, Cl. 74-625.000.
Sodler, Walter: *See—*
Egger, Joseph; Mayer, Franz; Schwartz, Herbert; Sodler, Walter; Suard, Jean; and Tilse, Wilhelm, 4,128,992, Cl. 58-23.00D.
Soeno, Ko; Iizuka, Tomio; Doi, Toshio; Ando, Hisashi; Oyama, Testuo; Sakamoto, Hiroshi; and Misumi, Akira, to Hitachi, Ltd. Cathode for cathode ray tube of directly heating type and process for producing the same cathode. 4,129,801, Cl. 313-346.00R.
Solai Vignola di Fabiani Orlando e C. - Societa in nome collettivo: *See—*
Abate, Giorgio, 4,128,975, Cl. 52-125.000.
Solar Control Corporation: *See—*
Kent, Thomas B., 4,129,116, Cl. 126-270.000.
Solowy, Jean, to FMC Corporation. Safety device for a relief valve with a controlled disk. 4,129,142, Cl. 137-492.000.
Somet Societa' Meccanica Tessile S.p.A.: *See—*
Merisio, Alberto, 4,129,155, Cl. 139-448.000.
Sorberg, Bengt: *See—*
Brehmer, Roland; and Sorberg, Bengt, 4,129,149, Cl. 137-599.100.
Southco, Inc.: *See—*
Bisbing, Robert H., 4,128,923, Cl. 24-221.00R.
Southwick, Roger A. Amplitude probability detector. 4,129,827, Cl. 324-77.00A.
Southwire Company: *See—*
Cofer, Daniel B.; Ward, George C.; and Proctor, Dale D., 4,129,170, Cl. 164-270.000.
Ward, George C., 4,129,742, Cl. 13-2.00P.
Spatafore, Robert M.: *See—*
Charbonneau, Robert R.; and Spatafore, Robert M., 4,128,984, Cl. 52-746.000.
Speckmann, Donald R.: *See—*
Scapes, John N.; and Speckmann, Donald R., 4,129,284, Cl. 251-205.000.
Spector, Donald, to Applied Research Commodities Ind., Inc. Inflatable terrarium assembly with controlled environment. 4,128,966, Cl. 47-69.000.
Spector, George: *See—*
Conklin, Harold E.; and Spector, George, 4,128,912, Cl. 15-257.700.
O'Neil, Theodore K.; and Spector, George, 4,129,227, Cl. 220-267.000.
Sperry Rand Corporation: *See—*
Aversano, Frank J.; Carver, Leon; and Seifert, Ludwik I., 4,129,365, Cl. 353-99.000.
Spes, Hellmuth: *See—*
Kunstle, Gerhard; Spes, Hellmuth; and Siegl, Herbert, 4,129,596, Cl. 260-561.00K.
Spisak, Steve: *See—*
Gogolin, Robert L.; and Spisak, Steve, 4,129,770, Cl. 219-98.000.
Spurgin, Anthony J.; and Schaefer, William F., to Westinghouse Electric Corp. Method of operating a nuclear reactor. 4,129,475, Cl. 176-22.000.
SRI International: *See—*
Green, Philip S., 4,129,799, Cl. 310-359.000.
Staaden, Adolf. Fishing planer. 4,128,959, Cl. 43-43.130.
Stahnecker, Erhard: *See—*
Keppler, Hans G.; Stahnecker, Erhard; and Moeller, Rolf, 4,129,706, Cl. 526-201.000.
Stainless Equipment Company: *See—*
Molitor, Victor D., 4,129,179, Cl. 165-101.000.
Standard Oil Company (Indiana): *See—*
Dabbous, Mahmoud K., 4,129,182, Cl. 166-263.000.
Jezl, James L.; and Peters, Edwin F., 4,129,701, Cl. 526-65.000.
Stangroom, James E., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Electric field responsive fluids. 4,129,513, Cl. 252-78.100.
Stanton, Martin G. Microscope assembly. 4,128,944, Cl. 33-180.00R.
Stauffer Chemical Company: *See—*
Elcik, Robert G., 4,129,535, Cl. 260-23.0XA.
Jin, Jung I., 4,129,710, Cl. 526-278.000.
Stayer, Mark L.: *See—*
Fieldhouse, John W.; Graves, Daniel F.; Cole, William M.; Stayer, Mark L.; and Fenske, Steven L., 4,129,529, Cl. 528-168.000.
Stecklow, James P. Loose leaf binder with rigid telescopic post assemblies and magnetically retained bar. 4,129,396, Cl. 402-46.000.
Steffen, Gunther B. H.: *See—*
Bergmann, Klaus W.; Steffen, Gunther B. H.; and Monkemoller, Herbert, 4,129,062, Cl. 90-11.00R.
Stein, Reinhardt P.; and Delecki, Daniel J., to American Home Products Corporation. Anti-ulcer methano-dibenzazocines derivatives. 4,129,561, Cl. 260-239.0BB.
Stengel, Fred H.: *See—*
Clement, Carl J.; Stengel, Fred H.; and Campbell, Kenneth S., 4,129,211, Cl. 206-213.100.
Stephens, Dennis L.: *See—*
Feldy, Edmund C.; and Stephens, Dennis L., 4,129,816, Cl. 318-696.000.
Stephens, Robert E.: *See—*
Schriber, Louis; and Stephens, Robert E., 4,129,293, Cl. 270-52.000.
Stephenson, Michael J.; and Eby, Robert S., to United States of America, Energy. Gas-absorption process. 4,129,425, Cl. 55-44.000.
Sterilaire Medical, Inc.: *See—*
Dout, James A.; and Foreman, Robert E., 4,129,122, Cl. 128-1.00R.
Sterling Drug Inc.: *See—*
Eggensperger, Heinz; and Beilfuss, Wolfgang, 4,129,517, Cl. 252-186.000.
Sterndent Corporation: *See—*
Vines, Raymond F., 4,129,680, Cl. 428-433.000.
Stewart, Walter P.; and Punte, Lawrence F., to Monsanto Company. High density led lead frame. 4,129,682, Cl. 428-571.000.
Stierle, Gunter: *See—*
Heinze, Horst; Stierle, Gunter; and Sach, Ernst D., 4,128,921, Cl. 24-279.000.
Stockel, Richard F., to American Chemical Consulting Corp. Animal litter composition. 4,129,094, Cl. 119-1.000.
Stoll, Kurt; and Kees, Ulrich. Control valve. 4,129,147, Cl. 137-596.100.
Stone, Gregory B. Game of skill. 4,129,302, Cl. 273-236.000.
Stoneback, John W. Medication container with quick release closure. 4,129,228, Cl. 220-293.000.
Stover, Dennis E., to Atlantic Richfield Company; NM Uranium, Inc.; and United States Steel Corporation, The. Method for locating the remaining recoverable mineral reserves during solution mining. 4,129,334, Cl. 299-4.000.
Strobel, Albert F., to GAF Corporation. Branched chain nonyl and dodecyl isomeric mixtures of 2-(5'-nonyl, or dodecyl-2'-hydroxyphenyl)benzotriazole as UV stabilizers. 4,129,521, Cl. 252-403.000.
Strohmeier, Helmut, to Kastinger, Hermann. Ski bindings. 4,129,319, Cl. 280-615.000.
Stubben, David R., to Atari, Inc. Apparatus for generating at least one moving object across a video display screen where wraparound of the object is avoided. 4,129,883, Cl. 358-104.000.
Sturt, Alan C.: *See—*
Park, Anthony J.; and Sturt, Alan C., 4,129,698, Cl. 526-3.000.
Stutz, Frank: *See—*
Bromley, James E.; Mowe, Wayne T.; and Stutz, Frank, 4,128,989, Cl. 57-247.000.
Suami, Tetsuo. 5,6-Epineamine and process for preparing the same. 4,129,719, Cl. 536-17.000.

Suard, Jean: *See—*
Egger, Joseph; Mayer, Franz; Schwartz, Herbert; Sodler, Walter; Suard, Jean; and Tilse, Wilhelm, 4,128,992, Cl. 58-23.00D.
Subterranean Tools Inc.: *See—*
Lupton, Homer B., 4,129,392, Cl. 403-25.000.
Suematsu, Masayasu: *See—*
Tamazawa, Tsuyoshi; Suematsu, Masayasu; and Morita, Hideo, 4,129,622, Cl. 261-39.00A.
Sugimoto, Kazuyasu; Yamaya, Hiroshi; and Ishimoto, Kameki, to Matsushita Electric Industrial Company, Limited. Connector assembly for printed circuit board. 4,129,351, Cl. 339-176.0MP.
Sugishita, Akio: *See—*
Machi, Sueo; Matsui, Yasushi; Sugishita, Akio; Sugo, Takanobu; Taniguchi, Hiroaki; Asano, Koichi; and Fujiwara, Hiroshi, 4,129,617, Cl. 260-879.000.
Sugiura, Susumu: *See—*
Fujii, Motoharu; Muramatsu, Takao; Koumura, Noboru; Sugiura, Susumu; Takekawa, Nobuhiro; and Tsukada, Syusei, 4,129,072, Cl. 101-1.000.
Sugo, Takanobu: *See—*
Machi, Sueo; Matsui, Yasushi; Sugishita, Akio; Sugo, Takanobu; Taniguchi, Hiroaki; Asano, Koichi; and Fujiwara, Hiroshi, 4,129,617, Cl. 260-879.000.
Sulzer Brothers Ltd.: *See—*
Vogeli, Ernst, 4,129,141, Cl. 137-462.000.
Sumida, Seizo: *See—*
Takemoto, Ichiki; Yoshida, Ryo; Sumida, Seizo; and Kamoshita, Katsuzo, 4,129,436, Cl. 71-120.000.
Sumitomo Chemical Company, Limited: *See—*
Kudo, Ken-ichi; Kitawaga, Yoshihiko; Koyama, Teruhisa; Takata, Akira; Kanagawa, Shuichi; and Yamaguchi, Tetsuo, 4,129,557, Cl. 526-283.000.
Takemoto, Ichiki; Yoshida, Ryo; Sumida, Seizo; and Kamoshita, Katsuzo, 4,129,436, Cl. 71-120.000.
Sumitomo Metal Industries, Ltd.: *See—*
Nashiwa, Hajime; Tsuzita, Susumu; and Nagahata, Tsutomu, 4,129,439, Cl. 75-58.000.
Sun Chemical Corporation: *See—*
Wengryn, Michael; and Khazan, Alexander, 4,129,187, Cl. 173-117.000.
Sun, Yen S. E.: *See—*
Cusano, Dominic A.; Loughran, James A.; and Sun, Yen S. E., 4,129,243, Cl. 228-122.000.
Sunamori, Takashi; Matsushima, Koji; and Tanaka, Susumu, to Mitsubishi Rayon Co., Ltd. Thermosetting acrylic copolymer usable as a powder paint and method for producing the same. 4,129,545, Cl. 260-29.6TA.
Sunds Aktiebolag: *See—*
Sjobom, Axel H., 4,129,263, Cl. 241-248.000.
Surpass Chemicals Limited: *See—*
Eliades, Theo I.; Muir, Ronald J.; and Horner, James D., 4,129,589, Cl. 260-504.00A.
Suzuki, Ryuichi; Hashizume, Akihide; Horiuchi, Hideyuki; Yamamoto, Shinji; and Yokouchi, Hisatake, to Hitachi, Ltd. Cell classification method. 4,129,854, Cl. 340-146.3CA.
Suzuki, Shigeto, to Chevron Research Company. Preparation of chloroacetyl chloride. 4,129,595, Cl. 260-544.00Y.
Suzuki, Shoji, to Alps Motorola. Magnetic recording and reproducing apparatus. 4,129,890, Cl. 360-94.000.
Suzuki, Suzuo; Nakajima, Masayasu; Koizumi, Ken-ichi; and Ookubo, Yoshio, to Nissan Motor Company, Limited. I.C.E. equipped with means for maintaining reactor temperature about a single temperature. 4,128,997, Cl. 60-274.000.
Suzuki, Yoshikuni: *See—*
Fukushima, Hideo; and Suzuki, Yoshikuni, 4,129,565, Cl. 546-142.000.
Suzuki, Yutaka: *See—*
Ito, Osamu; Hobo, Nobuhito; Suzuki, Yutaka; Kawamoto, Itsushi; Naitou, Takashi; Shiozaki, Makoto; and Konishi, Yoshimune, 4,129,105, Cl. 123-119.0EC.
Svet, Frank A., to General Signal Corporation. Technique for the detection of flat wheels on railroad cars by acoustical measuring means. 4,129,276, Cl. 246-169.00S.
Swacars, Inc.: *See—*
Bond, Ronald L.; Daughdrill, E. Chris; Brice, Henry T.; and Horton, Phineas E., III, 4,129,314, Cl. 280-425.00R.
Swarts, William A.: *See—*
Mageli, Orville L.; and Swarts, William A., 4,129,700, Cl. 260-823.000.
Sweatman, Travers F.: *See—*
Jones, Wilfred; Jones, Keith W.; and Sweatman, Travers F., 4,129,621, Cl. 261-39.00R.
Syntex (U.S.A.) Inc.: *See—*
Roszkowski, Adolph P.; Beard, Colin C.; Dvorak, Charles; and Weinhardt, Klaus, 4,129,661, Cl. 424-273.00R.
Synthelabo: *See—*
Giudicelli, Don P. R. L.; and Najer, Henry, 4,129,598, Cl. 260-570.80R.
t.h.e. Original Mirror Company: *See—*
Greenberg, Ronald C., 4,129,671, Cl. 428-48.000.
Tabler, Donald C.; and Johnson, Marvin M., to Phillips Petroleum Company. Recovering styrene by complexing with copper(I) sulfonates. 4,129,605, Cl. 260-669.00A.
Tabuchi, Yasuhide, to Mitsubishi Denki Kabushiki Kaisha. Terminal block. 4,129,353, Cl. 339-242.000.
Taccani, Riccardo, to Interbrev S. A. Method and apparatus for manufacturing open end sliding clasp fasteners. 4,129,639, Cl. 264-157.000.
Taguchi, Kazumasa; Nishida, Tsutomu; Kitajima, Masaharu; Aketa, Kan; Fujita, Isao; Onoda, Mamoru; Imanishi, Nobuyuki; and Watanabe, Ryo, to Kobe Steel, Ltd. Iron ore pellet having a specific shape and a method of making the same. 4,129,437, Cl. 75-5.000.
Tahara, Kiyokazu; and Kotoh, Keigo, to Mitsubishi Denki Kabushiki Kaisha. Radar beacon apparatus. 4,129,868, Cl. 343-6.80R.
Tai, Masaru: *See—*
Saikawa, Isamu; Takano, Shuntaro; Imaizumi, Hiroyuki; Takakura, Isamu; Ochiai, Hirokazu; Yasuda, Takashi; Taki, Hideo; Tai, Masaru; and Kodama, Yutaka, 4,129,730, Cl. 544-21.000.
Takagi, Norio: *See—*
Etchu, Masami; Yamaguchi, Takao; and Takagi, Norio, 4,129,630, Cl. 264-22.000.
Takagi, Tohru: *See—*
Makuuchi, Keizo; Araki, Kunio; Takagi, Tohru; Nakayama, Hiroyuki; and Kozu, Haruo, 4,129,487, Cl. 204-159.140.
Takagi, Yutaka; and Toyoda, Munemitsu, to Sharp Kabushiki Kaisha. Timer arrangement in a combination microwave oven and electric heating oven. 4,129,769, Cl. 219-10.55B.
Takahashi, Hiroshi: *See—*
Horiuchi, Kaoru; Matsui, Akio; Hara, Masahiro; and Takahashi, Hiroshi, 4,129,442, Cl. 75-126.00C.
Takahashi, Yutaka: *See—*
Inoue, Sho; Kawamata, Masanobu; Ushimaru, Hirokazu; Nakamichi, Koichi; and Takahashi, Yutaka, 4,129,649, Cl. 424-182.000.
Takakura, Isamu: *See—*
Saikawa, Isamu; Takano, Shuntaro; Imaizumi, Hiroyuki; Takakura, Isamu; Ochiai, Hirokazu; Yasuda, Takashi; Taki, Hideo; Tai, Masaru; and Kodama, Yutaka, 4,129,730, Cl. 544-21.000.
Takamatsu, Hiroshi: *See—*
Sato, Makoto; Takamatsu, Hiroshi; Miyagawa, Yoshitaka; and Fujii, Etsuo, 4,129,342, Cl. 303-105.000.
Takano, Shuntaro: *See—*
Saikawa, Isamu; Takano, Shuntaro; Imaizumi, Hiroyuki; Takakura, Isamu; Ochiai, Hirokazu; Yasuda, Takashi; Taki, Hideo; Tai, Masaru; and Kodama, Yutaka, 4,129,730, Cl. 544-21.000.
Takata, Akira: *See—*
Kudo, Ken-ichi; Kitawaga, Yoshihiko; Koyama, Teruhisa; Takata, Akira; Kanagawa, Shuichi; and Yamaguchi, Tetsuo, 4,129,557, Cl. 526-283.000.
Takeda Chemical Industries, Ltd.: *See—*
Marumoto, Ryuji M.; Furukawa, Yoshiyasu; and Kawai, Kiyohisa, 4,129,654, Cl. 424-251.000.
Takeda, Keiji: *See—*
Fujiwara, Masato; Takeda, Keiji; and Tsuboi, Masayoshi, 4,129,445, Cl. 96-29.00R.
Takekawa, Nobuhiro: *See—*
Fujii, Motoharu; Muramatsu, Takao; Koumura, Noboru; Sugiura, Susumu; Takekawa, Nobuhiro; and Tsukada, Syusei, 4,129,072, Cl. 101-1.000.
Takematsu, Tetsuo; Masuda, Fusayoshi; Tanaka, Kenji; Nishida, Kazuo; and Nakamura, Akira, to Sanyo Chemical Industries, Ltd. Agricultural chemical/resin compositions. 4,129,435, Cl. 71-65.000.
Takemoto, Ichiki; Yoshida, Ryo; Sumida, Seizo; and Kamoshita, Katsuzo, to Sumitomo Chemical Company, Limited. N'-[4-(substituted phenethyloxy)phenyl]-N-methyl-N-methoxyurea. 4,129,436, Cl. 71-120.000.
Taki, Hideo: *See—*
Saikawa, Isamu; Takano, Shuntaro; Imaizumi, Hiroyuki; Takakura, Isamu; Ochiai, Hirokazu; Yasuda, Takashi; Taki, Hideo; Tai, Masaru; and Kodama, Yutaka, 4,129,730, Cl. 544-21.000.
Talbott, Roblee L., to Coors Container Company. Container rotating means in apparatus for curing inks and decorative coatings. 4,129,206, Cl. 198-377.000.
Tamazawa, Tsuyoshi; Suematsu, Masayasu; and Morita, Hideo, to Nissan Motor Company, Limited. Carburetor with an altitude compensator. 4,129,622, Cl. 261-39.00A.
Tamm, Paul W., to Chevron Research Company. Hydrocarbon catalytic reforming process. 4,129,497, Cl. 208-138.000.
Tamura, Sadao: *See—*
Kobayashi, Kengo; Mogami, Masayuki; Tanaka, Shigeyoshi; Nakao, Manabu; and Tamura, Sadao, 4,129,610, Cl. 260-837.00R.
Tamura, Yoshitaka, to Bridgestone Cycle Co., Ltd. Brake for vehicles. 4,129,201, Cl. 188-76.000.
Tamutus, Donald J., to RCA Corporation. Method of making a thermoplastic lens by vacuum forming. 4,129,628, Cl. 264-1.000.
Tanaka, Kenji: *See—*
Takematsu, Tetsuo; Masuda, Fusayoshi; Tanaka, Kenji; Nishida, Kazuo; and Nakamura, Akira, 4,129,435, Cl. 71-65.000.
Tanaka, Shigeyoshi: *See—*
Kobayashi, Kengo; Mogami, Masayuki; Tanaka, Shigeyoshi; Nakao, Manabu; and Tamura, Sadao, 4,129,610, Cl. 260-837.00R.
Tanaka, Susumu: *See—*
Sunamori, Takashi; Matsushima, Koji; and Tanaka, Susumu, 4,129,545, Cl. 260-29.6TA.
Tanaka, Tetsuo: *See—*
Konno, Daisuke; and Tanaka, Tetsuo, 4,129,306, Cl. 277-30.000.
Taniguchi, Hiroaki: *See—*
Machi, Sueo; Matsui, Yasushi; Sugishita, Akio; Sugo, Takanobu; Taniguchi, Hiroaki; Asano, Koichi; and Fujiwara, Hiroshi, 4,129,617, Cl. 260-879.000.
Taniguchi, Masahiko: *See—*
Miyasita, Satoru; Taniguchi, Masahiko; and Kobayashi, Katsuyoshi, 4,129,289, Cl. 266-195.000.

Tansill, Horace A., to Falk Construction, Inc. Custom-formed insert. 4,128,951, Cl. 36-44.000.
Tantraporn, Wirojana; and Yu, Se P., to General Electric Company. Vertical field effect transistor. 4,129,879, Cl. 357-22.000.
Tasker, John: *See—*
Ridenour, Charles E.; Fabert, Herman A., Jr.; Tasker, John; and Larson, Hugo R., 4,129,773, Cl. 219-146.230.
Tayloe, Edward H.: *See—*
Shocklee, James L.; and Tayloe, Edward H., 4,129,048, Cl. 74-612.000.
Taylor, Harry E., to G. W. Taylor Industries Limited. Fascia and gutter systems on buildings. 4,128,974, Cl. 52-11.000.
Taylor, Joseph W. Actuator. 4,129,283, Cl. 251-62.000.
Teach, Ted L., to Laserplane Corporation. Automatic control of backhoe digging depth. 4,129,224, Cl. 214-763.000.
Tehon, Stephen W.; and Pruski, Edward M., to General Electric Company. Immersible liquid densitometer. 4,129,031, Cl. 73-32.00A.
Teichert, Allen L., to Robertshaw Controls Company. Cut-back thermostat construction. 4,129,847, Cl. 337-301.000.
Teijin Limited: *See—*
Etchu, Masami; Yamaguchi, Takao; and Takagi, Norio, 4,129,630, Cl. 264-22.000.
Tejima, Kouichi: *See—*
Okutomi, Tsutomu; Yoshino, Hisashi; Chiba, Seishi; Tsutsumi, Tadahito; and Tejima, Kouichi, 4,129,761, Cl. 200-144.00B.
Tektronix, Inc.: *See—*
Telewski, Fred J.; Beeck, Carlos L.; and Snow, Philip B., 4,129,897, Cl. 361-399.000.
Telaris Telecommunications, Inc.: *See—*
Gilano, Michael N.; and Hayes, James C., 4,129,758, Cl. 200-5.00A.
Telephone Utility Terminal Co., Inc.: *See—*
Lohsl, Gerald A., 4,129,743, Cl. 174-38.000.
Teletype Corporation: *See—*
Feldy, Edmund C.; and Stephens, Dennis L., 4,129,816, Cl. 318-696.000.
Telewski, Fred J.; Beeck, Carlos L.; and Snow, Philip B., to Tektronix, Inc. Modular mounting apparatus for substrate means bearing planar circuit means. 4,129,897, Cl. 361-399.000.
Temple, Steven J.: *See—*
Galani, Zvi; and Temple, Steven J., 4,129,839, Cl. 333-9.000.
Tenniswood, David M., to McGraw-Edison Company. Retractable roller support for use with flexible rolling support for conductors or conduits. 4,129,277, Cl. 248-51.000.
Tepral: *See—*
Moll, Manfred; D'Hardmemare, Christian; and Midoux, Nicolas, 4,129,029, Cl. 73-19.000.
Terakura, Yukio: *See—*
Akashi, Teruo; Watanabe, Kazuaki; and Terakura, Yukio, 4,129,050, Cl. 74-750.00R.
Texaco Development Corporation: *See—*
Schulze, Heinz, 4,129,716, Cl. 528-68.000.
Texaco Inc.: *See—*
Kalfoglou, George, 4,129,183, Cl. 166-300.000.
Textron Inc.: *See—*
Carey, Lee F.; and Friona, Anthony J., 4,129,025, Cl. 72-348.000.
Tezuka, Nobuo: *See—*
Yamamichi, Masayoshi; Iura, Yukio; Tezuka, Nobuo; Watanabe, Satoshi; Uchidoi, Masanori; and Aizawa, Hiroshi, 4,129,877, Cl. 354-271.000.
Thalmann, Rene A., to Elektro-Apparatebau Olten A.G. Pulse-rate indicator. 4,129,124, Cl. 128-2.05T.
Thelen, Franz; and Weber, Henning, to Deutsche Babcock Aktiengesellschaft. Method and apparatus for the storage of energy in power plants. 4,129,004, Cl. 60-652.000.
Thermal Transfer, division of Kleinewefers: *See—*
Heyn, Fred M.; Yin, Ching-Feng; Hanson, Gordon L.; and Schreck, Robert C., 4,129,176, Cl. 165-7.000.
Thermograte, Inc.: *See—*
Bergstrom, Theodore R., 4,129,113, Cl. 126-121.000.
Theurer Atlantic Incorporated: *See—*
Theurer, John; Guenzel, William C.; and Beck, Orville F., 4,129,395, Cl. 403-317.000.
Theurer, John; Guenzel, William C.; and Beck, Orville F., to Theurer Atlantic Incorporated. Container lock assembly. 4,129,395, Cl. 403-317.000.
Thomas C. Elder, Inc.: *See—*
Glunz, Louis J.; and Dickson, Donald E., 4,129,575, Cl. 260-343.210.
Glunz, Louis J.; and Dickson, Donald E., 4,129,576, Cl. 260-343.210.
Thompson, Andy L. Breather bag apparatus. 4,129,069, Cl. 99-646.00S.
Thompson, Morice W.; and Topham, Arthur, to Imperial Chemical Industries Limited. Dispersions. 4,129,455, Cl. 106-308.00N.
Thompson, Neil E. S., to Petrolite Corporation. Amino compounds and use thereof as antioxidants. 4,129,597, Cl. 260-563.00P.
Thomson-CSF: *See—*
Defranould, Philippe, 4,129,798, Cl. 310-313.000.
Hartemann, Pierre, 4,129,837, Cl. 331-107.00A.
Thonnes, Horst; and Wunsche, Joachim, to Mannesmann Aktiengesellschaft. Piercing a solid billet. 4,129,022, Cl. 72-41.000.
Thuong, Nguyen T.: *See—*
Warolin, Christian J.; Chabrier de Lassauniere, Pierre; and Thuong, Nguyen T., 4,129,660, Cl. 424-203.000.
Tibbetts, Willis F., to Norris Industries, Inc. Rockets including trajectory controls. 4,129,268, Cl. 244-3.220.
Tighe, Michael R.; and McCutchen, Hugh L., to Diamond Shamrock Corporation. Swimming pool chlorinator system. 4,129,493, Cl. 204-228.000.
Tilse, Wilhelm: *See—*
Egger, Joseph; Mayer, Franz; Schwartz, Herbert; Sodler, Walter; Suard, Jean; and Tilse, Wilhelm, 4,128,992, Cl. 58-23.00D.
Timex Corporation: *See—*
Egger, Joseph; Mayer, Franz; Schwartz, Herbert; Sodler, Walter; Suard, Jean; and Tilse, Wilhelm, 4,128,992, Cl. 58-23.00D.
Title, Alan M.: *See—*
United States of America, National Aeronautics and Space Administration; and Title, Alan M., 4,129,357, Cl. 350-157.000.
Toalson, David C. Apparatus for wear detection. 4,129,037, Cl. 73-151.000.
Tobler, Hans: *See—*
Bellus, Daniel; Fory, Werner; and Tobler, Hans, 4,129,573, Cl. 260-326.450.
Todd, David B., to Baker Perkins Inc. Centrifuge for separating solids and liquids. 4,129,249, Cl. 233-7.000.
Todeschini, Eugenio; and Riganti, Gian P., to Massey-Ferguson Services N.V. Hydrostatic transmissions. 4,129,192, Cl. 180-6.480.
Tohyama, Yoshikuni: *See—*
Miyamoto, Koichi; Tohyama, Yoshikuni; Sagara, Seiji; Kimura, Yoshimasa; and Ishida, Masato, 4,129,377, Cl. 355-14.000.
Tokyo Sanyo Electric Co., Ltd.: *See—*
Ishii, Yasuhiro; Hirose, Shintaro; and Kawasaki, Ryoichi, 4,129,195, Cl. 181-167.000.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Kawagai, Kenji; and Yoshida, Shigeki, 4,129,792, Cl. 307-270.000.
Okutomi, Tsutomu; Yoshino, Hisashi; and Chiba, Seishi, 4,129.760, Cl. 200-144.00B.
Okutomi, Tsutomu; Yoshino, Hisashi; Chiba, Seishi; Tsutsumi, Tadahito; and Tejima, Kouichi, 4,129,761, Cl. 200-144.00B.
Torii, Kenichi; and Fujimori, Shigeo, 4,129,842, Cl. 334-15.000.
Toman, Donald J., to Tull Aviation Corporation. Apparatus for synthesis of scanning beam. 4,129,870, Cl. 343-106.00R.
Toman, Donald J., to Tull Aviation Corporation. Microwave radiating element and antenna array including linear phase shift progression angular tilt. 4,129,872, Cl. 343-768.000.
Tomlinson, Thomas A. Plumbing tool with external shackle. 4,128,930, Cl. 29-213.00R.
Tomy Kogyo Co., Inc.: *See—*
Ogasawara, Toyotsugu, 4,128,964, Cl. 46-43.000.
Toot, Peter D., to General Electric Company. Method and apparatus for stabilizing an augmenter system. 4,128,995, Cl. 60-204.000.
Topham, Arthur: *See—*
Thompson, Morice W.; and Topham, Arthur, 4,129,455, Cl. 106-308.00N.
Topolewski, John: *See—*
Clark, Frederick P.; Johnson, Robert C.; and Topolewski, John, 4,129,527, Cl. 252-547.000.
Torii, Kenichi; and Fujimori, Shigeo, to Tokyo Shibaura Electric Co., Ltd. U-shaped microstrip resonant circuit. 4,129,842, Cl. 334-15.000.
Torikai, Kiyoshige, to Mitsubishi Jukogyo Kabushiki Kaisha. Vacuum forming or reduced-pressure moulding. 4,129,164, Cl. 164-7.000.
Tosh, Douglas J.: *See—*
Matheson, Alister F.; Tosh, Douglas J.; and Borr, Mitchell, 4,129,542, Cl. 260-28.5AS.
Towle, Gordon A.: *See—*
Jamison, Joel D.; Towle, Gordon A.; and Vermeychuk, J. Gregory, 4,129,663, Cl. 426-602.000.
Townsend Engineering Company: *See—*
Townsend, Ray T., 4,129,101, Cl. 123-41.560.
Townsend, Ray T., to Townsend Engineering Company. Internal combustion engine. 4,129,101, Cl. 123-41.560.
Toyama Chemical Co., Ltd.: *See—*
Saikawa, Isamu; Takano, Shuntaro; Imaizumi, Hiroyuki; Takakura, Isamu; Ochiai, Hirokazu; Yasuda, Takashi; Taki, Hideo; Tai, Masaru; and Kodama, Yutaka, 4,129,730, Cl. 544-21.000.
Toyoda, Munemitsu: *See—*
Takagi, Yutaka; and Toyoda, Munemitsu, 4,129,769, Cl. 219-10.55B.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Akashi, Teruo; Watanabe, Kazuaki; and Terakura, Yukio, 4,129,050, Cl. 74-750.00R.
Habu, Nobuo, 4,129,100, Cl. 123-32.00L.
Momura, Takao; Umemoto, Yoshiro; and Sakamoto, Tatsuo, 4,129,672, Cl. 428-138.000.
Shigenobu, Hiromichi; Isobe, Toshiaki; and Kondo, Minoru, 4,129,812, Cl. 318-484.000.
Shindo, Yoshio; and Ito, Hiroshi, 4,129,051, Cl. 74-867.000.
Toyouchi, Kaoru: *See—*
Yasuike, Akio; Kataoka, Hiroshi; and Toyouchi, Kaoru, 4,129,635, Cl. 264-45.500.
Tracy, David J.; and Hoffstadt, Walter F., to GAF Corporation. Amidine compounds. 4,129,739, Cl. 560-21.000.
Traficante, Daniel D. Wide-band nuclear magnetic resonance spectrometer. 4,129,822, Cl. 324-0.5AH.
Traisnel, Jean-Pierre: *See—*
Deflandre, Jean; Matarasso, Pierre; and Traisnel, Jean-Pierre, 4,129,360, Cl. 350-289.000.
Transitube Project: *See—*
Conca, Gilbert G., 4,129,234, Cl. 222-235.000.
Trenc, Ramon B., to Bendibercia, S.A. Control device for a pneumatic braking system. 4,129,340, Cl. 303-6.00R.
TRW Inc.: *See—*
Gogolin, Robert L.; and Spisak, Steve, 4,129,770, Cl. 219-98.000.

Tsao, Utah, to Lummus Company, The. Reactor effluent quench system. 4,129,604, Cl. 260-656.00R.
Tschunt, Edgar; Platz, Winfried; Bar, Ulrich; and Heinz, Lothar, to Siemens Aktiengesellschaft. Gamma camera. 4,129,784, Cl. 250-505.000.
Tshudy, James A.: *See—*
Bennett, Roxanne L.; and Tshudy, James A., 4,129,416, Cl. 8-115.000.
Tsuboi, Masayoshi: *See—*
Fujiwara, Masato; Takeda, Keiji; and Tsuboi, Masayoshi, 4,129,445, Cl. 96-29.00R.
Tsubouchi, Hideo: *See—*
Hattori, Tadashi; Nakase, Takamichi; Tsubouchi, Hideo; and Iwata, Toshiharu, 4,128,998, Cl. 60-277.000.
Tsukada, Syusei: *See—*
Fujii, Motoharu; Muramatsu, Takao; Koumura, Noboru; Sugiura, Susumu; Takekawa, Nobuhiro; and Tsukada, Syusei, 4,129,072, Cl. 101-1.000.
Tsukioka, Hideo: *See—*
Seki, Masatoshi; Sato, Moriichi; Tsukioka, Hideo; Ohe, Etuo; Ogata, Masatsugu; and Mitsuoka, Akio, 4,129,678, Cl. 428-383.000.
Tsutsumi, Tadahito: *See—*
Okutomi, Tsutomu; Yoshino, Hisashi; Chiba, Seishi; Tsutsumi, Tadahito; and Tejima, Kouichi, 4,129,761, Cl. 200-144.00B.
Tsuzita, Susumu: *See—*
Nashiwa, Hajime; Tsuzita, Susumu; and Nagahata, Tsutomu, 4,129,439, Cl. 75-58.000.
Tu, Shu-Tung: *See—*
Lorenz, Donald H.; Tu, Shu-Tung; and Wyman, Donald P., 4,129,667, Cl. 427-44.000.
Lorenz, Donald H.; and Tu, Shu-Tung, 4,129,709, Cl. 526-264.000.
Tull Aviation Corporation: *See—*
Toman, Donald J., 4,129,870, Cl. 343-106.00R.
Toman, Donald J., 4,129,872, Cl. 343-768.000.
Turco, Joseph. Method of scanning a radar antenna to effect improved radar operation. 4,129,866, Cl. 343-5.00R.
Turner, Sam R., to Xerox Corporation. Monomers having pendant electron acceptor groups-process for preparation and use. 4,129,581, Cl. 260-348.450.
Tustaniwskyj, Jerry I.: *See—*
Kasu, Abdul L.; and Tustaniwskyj, Jerry I., 4,129,892, Cl. 360-130.000.
Tykulsky, Alexander: *See—*
Dias, J. Fleming; Karrer, Henry E.; and Tykulsky, Alexander, 4,129,242, Cl. 228-121.000.
Tyrer, Richard G.: *See—*
France, James R.; Buchan, John D.; Tyrer, Richard G.; De Ceuleneer, Adolf; and Van Steenkiste, Robert, 4,129,091, Cl. 118-50.000.
Uchida, Katsuzo; Uchiyama, Hiroaki; and Mitsuyama, Akira, to Sharp Kabushiki Kaisha. Electrophotographic copying machine having moving carrier for original. 4,129,374, Cl. 355-8.000.
Uchidoi, Masanori: *See—*
Yamamichi, Masayoshi; Iura, Yukio; Tezuka, Nobuo; Watanabe, Satoshi; Uchidoi, Masanori; and Aizawa, Hiroshi, 4,129,877, Cl. 354-271.000.
Uchiyama, Hiroaki: *See—*
Uchida, Katsuzo; Uchiyama, Hiroaki; and Mitsuyama, Akira, 4,129,374, Cl. 355-8.000.
Ueda, Kazuo: *See—*
Gerstine, Milton I.; Goldberg, Joshua I.; Futatsugi, Setsuo; Ueda, Kazuo; Seo, Ryozo; Iwasaki, Koji; and Uemura, Makoto, 4,129,275, Cl. 244-181.000.
Uehara, Hiroshi: *See—*
Nagai, Haruo; Uehara, Hiroshi; and Nunokawa, Kunikazu, 4,129,524, Cl. 252-478.000.
Uemura, Makoto: *See—*
Gerstine, Milton I.; Goldberg, Joshua I.; Futatsugi, Setsuo; Ueda, Kazuo; Seo, Ryozo; Iwasaki, Koji; and Uemura, Makoto, 4,129,275, Cl. 244-181.000.
Ultrasonics, Ltd.: *See—*
Grange, Arthur; and Booth, Stuart E., 4,129,387, Cl. 366-119.000.
Umeda, Haruhiko; Ito, Ryuji; Yokoyama, Akinori; and Komatsu, Mitsuaki, to Kabushiki Kaisha Komatsu Seisakusho. Hydraulic torque converter. 4,129,000, Cl. 60-361.000.
Umemoto, Yoshiro: *See—*
Momura, Takao; Umemoto, Yoshiro; and Sakamoto, Tatsuo, 4,129,672, Cl. 428-138.000.
Uni-Cardan AG: *See—*
Krude, Werner, 4,129,345, Cl. 308-191.000.
Unigate Limited: *See—*
Henson, Kenneth, 4,129,689, Cl. 429-101.000.
Union Carbide Corporation: *See—*
Flanigen, Edith M.; Lok, Brent M.; and Mumbach, Norbert R., 4,129,450, Cl. 106-120.000.
Kaduboski, Mitchell J., 4,129,686, Cl. 429-61.000.
Union Minerale: *See—*
Kahane, Lucien, 4,129,549, Cl. 260-40.00R.
Union Oil Company of California: *See—*
Young, Dean A., 4,129,409, Cl. 431-3.000.
Uniroyal Ltd.: *See—*
Matheson, Alister F.; Tosh, Douglas J.; and Borr, Mitchell, 4,129,542, Cl. 260-28.5AS.
Unisearch Limited: *See—*
Chaikin, Malcolm; and Nossar, Mstislav S., 4,129,250, Cl. 236-44.00A.
Unitech Chemical Inc.: *See—*
Kooi, John H.; Schure, Ralph M.; and Brown, John M., 4,129,607, Cl. 260-835.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Stangroom, James E., 4,129,513, Cl. 252-78.100.
U.S. Fiber Corporation: *See—*
Mudgett, Donald F., 4,129,338, Cl. 302-2.00A.
United States of America
Agriculture: *See—*
Sanderson, William A., 4,129,588, Cl. 260-502.40P.
Army: *See—*
Angello, Joseph P., 4,129,893, Cl. 361-21.000.
Papayoanou, Aristotle, 4,129,836, Cl. 331-94.50D.
Walker, Clarence H., Jr.; and Corrie, John D., 4,129,459, Cl. 148-4.000.
Commerce: *See—*
Carpenter, Robert J.; and Yee, Kenneth W., 4,129,864, Cl. 340-347.0AD.
Energy: *See—*
Cleland, John W.; Westbrook, Russell D.; Wood, Richard F.; and Young, Rosa T., 4,129,463, Cl. 148-33.000.
Korenko, Michael K., 4,129,462, Cl. 148-31.000.
Sammarone, Dino G., 4,129,476, Cl. 176-37.000.
Stephenson, Michael J.; and Eby, Robert S., 4,129,425, Cl. 55-44.000.
Federal Communications Commission: *See—*
Luedtke, Arthur; and Bentley, William F., 4,129,874, Cl. 343-854.000.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Title, Alan M. Partial polarizer filter. 4,129,357, Cl. 350-157.000.
Navy: *See—*
Dimmick, Joseph G.; Weingartner, William J.; Fields, Alan S.; Fairhead, Donald L.; and Musson, Rosemary, 4,129,087, Cl. 114-144.00E.
Johnson, Duane M.; and Webster, Henry A., III, 4,129,465, Cl. 149-19.300.
U.S. Philips Corporation: *See—*
Fischer, Karl; and Matetschlager, Walter, 4,129,688, Cl. 429-97.000.
Kerstens, Franciscus N. A., 4,129,834, Cl. 331-91.000.
Van Benthem, Willem; and Schmidt, Ernst M., 4,129,800, Cl. 313-25.000.
Vrenken, Louis E.; Oostvogels, Franciscus M. P.; and van der Wolf, Rein W., 4,129,802, Cl. 313-492.000.
United States Steel Corporation, The: *See—*
Stover, Dennis E., 4,129,334, Cl. 299-4.000.
United Technologies Corp.: *See—*
Damiano, Paul J., 4,129,685, Cl. 429-38.000.
Maricle, Donald L., 4,129,683, Cl. 429-21.000.
University of California, Regents of the: *See—*
Gray, Paul R.; McCreary, James L.; and Hodges, David A., 4,129,863, Cl. 340-347.0AD.
University of Miami, The: *See—*
Pressman, Berton C.; and deGuzman, Norberto T., 4,129,659, Cl. 424-283.000.
UOP Inc.: *See—*
Gewartowski, Steve A., 4,129,606, Cl. 260-674.00R.
Janowski, Kenneth R.; Shum, Ming S.; and Bradley, Steven A., 4,129,181, Cl. 165-133.000.
Loboda, Robert S., 4,129,496, Cl. 208-134.000.
Maffet, Vere, 4,128,946, Cl. 34-12.000.
Mellbom, Marvin E., 4,129,626, Cl. 261-114.0JP.
Michalko, Edward, 4,129,522, Cl. 252-453.000.
Upjohn Company, The: *See—*
Bundy, Gordon L., 4,129,724, Cl. 542-426.000.
Bundy, Gordon L., 4,129,725, Cl. 542-426.000.
Bundy, Gordon L., 4,129,726, Cl. 542-426.000.
Bundy, Gordon L., 4,129,727, Cl. 542-426.000.
Chen, Augustin T.; Farrissey, William J., Jr.; and Nelb, Robert G., II, 4,129,715, Cl. 528-67.000.
Yankee, Ernest W., 4,129,582, Cl. 260-408.000.
Uraneck, Carl A.: *See—*
Selman, Charles M.; and Uraneck, Carl A., 4,129,558, Cl. 260-823.000.
Urban, Hans: *See—*
Wolfseder, Alfons; Urban, Hans; and Redl, Simon, 4,129,504, Cl. 210-247.000.
Urdal, Jan, to Schlage Lock Company. Cartridge for a lockset. 4,129,019, Cl. 70-107.000.
Ushimaru, Hirokazu: *See—*
Inoue, Sho; Kawamata, Masanobu; Ushimaru, Hirokazu; Nakamichi, Koichi; and Takahashi, Yutaka, 4,129,649, Cl. 424-182.000.
USM Corporation: *See—*
Fakla, Istvan E.; and Grote, Reinhard, 4,129,539, Cl. 260-27.00R.
Usui, Kazuo: *See—*
Nakahara, Yasushi; Ohtomo, Tadasuke; Yokota, Shinichi; and Usui, Kazuo, 4,129,008, Cl. 405-303.000.
Utner, Ferdinand: *See—*
Gaenge, Friedrich J.; Utner, Ferdinand; Vetter, Harald; and Vilsmeier, Gerhart, 4,128,926, Cl. 29-25.420.
Vall, Seymour. Shelf support device. 4,129,080, Cl. 108-149.000.

Van Kooten B.V.: *See—*
Schnell, Hans G., 4,129,002, Cl. 60-633.000.

Van Benthem, Willem; and Schmidt, Ernst M., to U.S. Philips Corporation. Gas and/or vapor discharge lamp. 4,129,800, Cl. 313-25.000.

van der Lely, Cornelis. Opposed piston engine. 4,129,102, Cl. 123-51.00B.

van der Pool, Kees; Rosinski, Louis S., Jr.; and Belli, Johann B., to Sensor Technology, Inc. System for determining the current-voltage characteristics of a photovoltaic array. 4,129,823, Cl. 324-20.00R.

van der Wolf, Rein W.: *See—*
Vrenken, Louis E.; Oostvogels, Franciscus M. P.; and van der Wolf, Rein W., 4,129,802, Cl. 313-492.000.

Van Eck, William F. Staple-type fastener. 4,129,059, Cl. 85-49.000.

Van Eenam, Donald N.: *See—*
Petrovich, John P.; and Van Eenam, Donald N., 4,129,528, Cl. 260-823.000.

Vanlandingham, Harold W.; Boggs, Roger L.; Bullock, David A.; and Maytum, James N., to Caterpillar Tractor Co. Method for turning a track bushing. 4,128,932, Cl. 29-401.00R.

Van Steenkiste, Robert: *See—*
France, James R.; Buchan, John D.; Tyrer, Richard G.; De Ceuleneer, Adolf; and Van Steenkiste, Robert, 4,129,091, Cl. 118-50.000.

Varga, John M. J., to Carding Specialists (Canada) Limited. Carding engines. 4,128,917, Cl. 19-105.000.

Varo, Inc.: *See—*
Laughlin, Richard H., 4,129,780, Cl. 250-333.000.

Vereinigte Osterreichische Eisen-und Stahlwerke - Alpine Montan Aktiengesellschaft: *See—*
Holleis, Gunter; and Hargassner, Reinhard, 4,129,174, Cl. 164-443.000.
Laimer, Friedrich; and Moser, Peter, 4,129,288, Cl. 266-158.000.
Scheurecker, Werner; and Hargassner, Reinhard, 4,129,173, Cl. 164-442.000.

Vermeychuk, J. Gregory: *See—*
Jamison, Joel D.; Towle, Gordon A.; and Vermeychuk, J. Gregory, 4,129,663, Cl. 426-602.000.

Vetter, Clarence J., Jr.: *See—*
Colburn, Samuel E.; Bryant, Duane K.; Platz, Gerald M.; and Vetter, Clarence J., Jr., 4,129,714, Cl. 526-331.000.

Vetter, Harald: *See—*
Gaenge, Friedrich J.; Utner, Ferdinand; Vetter, Harald; and Vilsmeier, Gerhart, 4,128,926, Cl. 29-25.420.

Vilsmeier, Gerhart: *See—*
Gaenge, Friedrich J.; Utner, Ferdinand; Vetter, Harald; and Vilsmeier, Gerhart, 4,128,926, Cl. 29-25.420.

Vinal, Albert W., to International Business Machines Incorporated. Channel depletion boundary modulation magnetic field sensor. 4,129,880, Cl. 357-27.000.

Vines, Raymond F., to Sterndent Corporation. Chrome dental alloy. 4,129,680, Cl. 428-433.000.

Vinner, Robert E.; Parisot, Max; and Parisot, Jacques. Joining of a multiple-layer fabric by invisible stitching. 4,129,083, Cl. 112-178.000.

Vinogradov, Georgy V.: *See—*
Nametkin, Nikolai S.; Vinogradov, Georgy V.; Podolsky, Jury Y.; Pavlovskaya, Nina T.; Frenkin, Ernest I.; and Yanovsky, Jury G., 4,129,550, Cl. 260-42.220.

Viout, Andre; and Pasero, Regine, to L'Oreal. Polymers comprising vinyl esters-crotonic acid. 4,129,711, Cl. 526-286.000.

Vivitar Corporation: *See—*
Allgeier, Michael, 4,129,372, Cl. 355-1.000.

Vixie, Dennis E.: *See—*
Bowerman, William J.; James, Stanley L.; and Vixie, Dennis E., 4,128,950, Cl. 36-30.00R.

Vogeli, Ernst, to Sulzer Brothers Ltd. Scram valve. 4,129,141, Cl. 137-462.000.

Vokes, Robert F., to Black Clawson Company, The. Apparatus for pulping waste paper materials. 4,129,259, Cl. 241-20.000.

Volk, Stanley W.: *See—*
Erickson, Marlo W. V.; and Volk, Stanley W., 4,129,044, Cl. 74-244.000.

von Gizycki, Ulrich: *See—*
Schapel, Dietmar; and von Gizycki, Ulrich, 4,129,697, Cl. 521-176.000.

von Roesgen, Charles A., to Bell Telephone Laboratories, Incorporated. Quick-connect breadboarding system. 4,129,349, Cl. 339-17.00C.

Vrenken, Louis E.; Oostvogels, Franciscus M. P.; and van der Wolf, Rein W., to U.S. Philips Corporation. Low-pressure mercury vapor discharge lamp. 4,129,802, Cl. 313-492.000.

Vulcan Industrial Packaging Limited: *See—*
Wrycraft, Norman E.; and Collins, Alistair K., 4,129,236, Cl. 222-570.000.

W. A. Kates Company, The: *See—*
Kates, Willard A., 4,129,624, Cl. 261-76.000.

W. A. Whitney Corp.: *See—*
Brolund, Theodore F.; and Scott, William B., 4,129,460, Cl. 148-9.00R.

W. C. Heraeus GmbH: *See—*
Herklotz, Gunther; and Reichelt, Walter, 4,129,765, Cl. 200-268.000.

W. R. Grace & Co.: *See—*
Cogliano, Joseph A.; and Kehr, Clifton L., 4,129,694, Cl. 521-107.000.

Wacker-Chemie GmbH: *See—*
Kunstle, Gerhard; Spes, Hellmuth; and Siegl, Herbert, 4,129,596, Cl. 260-561.00K.
Roth, Michael; and Gogolok, Konrad, 4,129,447, Cl. 106-2.000.

Wagner, Hans: *See—*
Maierhofer, Alfred; and Wagner, Hans, 4,129,593, Cl. 562-557.000.

Wahl, John S.; and Schuster, Nick A., to Schlumberger Technology Corporation. Cement thickness measurements in cased boreholes. 4,129,777, Cl. 250-264.000.

Wakazono, Kenji: *See—*
Ishiguro, Yasuo; and Wakazono, Kenji, 4,129,370, Cl. 354-234.000.

Wakeman, Alden H.; and Heiliger, Leonard R., to Crepaco, Inc. Agitator construction. 4,129,389, Cl. 366-144.000.

Walker, Clarence H., Jr.; and Corrie, John D., to United States of America, Army. Method for diminishing the strength and ductility of steel utilizing a lithium-indium-amalgam containing a small amount of vanadium pentoxide. 4,129,459, Cl. 148-4.000.

Walker, Ray A.; Reich, Fred R.; and Russell, James T., to Batelle Memorial Institute. Optical extensometer. 4,129,384, Cl. 356-381.000.

Wallhausser, Karl H.; Cuntze, Ulrich; May, Adolf; and Bucking, Hans-Walter, to Hoechst Aktiengesellschaft. Fabric softeners. 4,129,506, Cl. 252-8.800.

Wallington, John R.; and Greed, Robert B., to Marconi Company Limited, The. Switching arrangements. 4,129,838, Cl. 333-7.00D.

Walrave, Jean, to Eurotungstene. Process of making metallic non-skid studs for tires. 4,128,933, Cl. 29-420.500.

Walther, William D., to Dayton-Walther Corporation. Base flanged tire carrying rim and wheel. 4,129,336, Cl. 301-12.00R.

Ward, George C., to Southwire Company. Plasma arc vertical shaft furnace. 4,129,742, Cl. 13-2.00P.

Ward, George C.: *See—*
Cofer, Daniel B.; Ward, George C.; and Proctor, Dale D., 4,129,170, Cl. 164-270.000.

Warolin, Christian J.; Chabrier de Lassauniere, Pierre; and Thuong, Nguyen T., to Agence Nationale de Valorisation de la Recherche (ANVAR). Derivatives of cis-epoxy-1,2-propyl-phosphonic acid and drugs containing in particular as active ingredients derivatives of cis-epoxy-1,2-propylphosphonic acid in dextrorotatory form. 4,129,660, Cl. 424-203.000.

Washbourne, Colin: *See—*
Jeffreys, Godfrey V.; Mumford, Clive J.; Ravault, Frank E. G.; and Washbourne, Colin, 4,129,500, Cl. 210-23.00R.

Wasmuth, Edward H.: *See—*
McAleer, William J.; and Wasmuth, Edward H., 4,129,646, Cl. 424-89.000.

Watakabe, Yuichi, to Furukawa Denchi Kabushiki Kaisha. Float type metal-air battery. 4,129,684, Cl. 429-27.000.

Watanabe, Kazuaki: *See—*
Akashi, Teruo; Watanabe, Kazuaki; and Terakura, Yukio, 4,129,050, Cl. 74-750.00R.

Watanabe, Ryo: *See—*
Taguchi, Kazumasa; Nishida, Tsutomu; Kitajima, Masaharu; Aketa, Kan; Fujita, Isao; Onoda, Mamoru; Imanishi, Nobuyuki; and Watanabe, Ryo, 4,129,437, Cl. 75-5.000.

Watanabe, Sakuji, to Nippon Kogaku K.K. Photometric device for a camera. 4,129,366, Cl. 354-24.000.

Watanabe, Satoshi: *See—*
Yamamichi, Masayoshi; Iura, Yukio; Tezuka, Nobuo; Watanabe, Satoshi; Uchidoi, Masanori; and Aizawa, Hiroshi, 4,129,877, Cl. 354-271.000.

Watson, James H. P.: *See—*
Clark, Norman O.; and Watson, James H. P., 4,129,498, Cl. 209-213.000.

Watson, Kenneth, to Westland Aircraft Limited. Helicopter rotors. 4,129,403, Cl. 416-134.00A.

Waugh, John B. S.: *See—*
Hunts, Barney D.; and Waugh, John B. S., 4,129,813, Cl. 318-561.000.

Weaver, Daniel E. Means and method of tiled surface construction. 4,128,982, Cl. 52-367.000.

Webb, Harry M., to Natural Resources Guardianship International, Inc. Catalytic fuel additive for jet, gasoline, diesel, and bunker fuels. 4,129,421, Cl. 44-56.000.

Webb, Paul P., to RCA Limited. Multi-element avalanche photodiode having reduced electrical noise. 4,129,878, Cl. 357-13.000.

Weber, Henning: *See—*
Thelen, Franz; and Weber, Henning, 4,129,004, Cl. 60-652.000.

Webster, Henry A., III: *See—*
Johnson, Duane M.; and Webster, Henry A., III, 4,129,465, Cl. 149-19.300.

Weck, Frederick, III. Carpet lifting method and apparatus. 4,129,326, Cl. 294-8.600.

Wei, John S. S., to Northern Telecom Limited. Optical system for imaging an elongate object in rearranged sections. 4,129,358, Cl. 350-173.000.

Weigand, Hans: *See—*
Hormann, Karl; and Weigand, Hans, 4,129,344, Cl. 308-187.000.

Weiland, Richard H.: *See—*
Robinson, Ronald H.; and Weiland, Richard H., 4,129,270, Cl. 244-135.00A.

Weingartner, William J.: *See—*
Dimmick, Joseph G.; Weingartner, William J.; Fields, Alan S.; Fairhead, Donald L.; and Musson, Rosemary, 4,129,087, Cl. 114-144.00E.

Weinhardt, Klaus: *See—*
Roszkowski, Adolph P.; Beard, Colin C.; Dvorak, Charles; and Weinhardt, Klaus, 4,129,661, Cl. 424-273.00R.

Weinrich, Erwin: *See—*
Rose, David; Weinrich, Erwin; and Lieske, Edgar, 4,129,413, Cl. 8-10.200.

Weisner, Carl S.: *See—*
Olson, Carl B.; Weisner, Carl S.; and Parker, Phillip H., 4,129,632, Cl. 264-40.100.

Welk, Steven, to Electric Power Research Institute, Inc. Fault current limiting resistor. 4,129,849, Cl. 338-21.000.

Wells, Ronald W.: *See—*
Deverell, Christopher; and Wells, Ronald W., 4,129,469, Cl. 156-157.000.

Wells, William M., to Hudson, Thomas H., a part interest. Multi-directional positioner. 4,129,844, Cl. 335-268.000.

Welsh, Alan B.: *See—*
Whittington, Billy J.; Burns, Timothy L.; and Welsh, Alan B., 4,129,055, Cl. 84-1.010.

Wengryn, Michael; and Khazan, Alexander, to Sun Chemical Corporation. Electro-mechanical vibrator. 4,129,187, Cl. 173-117.000.

Wenk, Raymond C., to Matrix IV, Inc. Adjustable snap-on-clamp. 4,128,918, Cl. 24-16.00R.

Wess, Guenter: *See—*
Fink, Helmuth; and Wess, Guenter, 4,129,831, Cl. 324-57.00H.

Westbrook, Russell D.: *See—*
Cleland, John W.; Westbrook, Russell D.; Wood, Richard F.; and Young, Rosa T., 4,129,463, Cl. 148-33.000.

Western Gear Corporation: *See—*
Moller, Walter H., 4,129,221, Cl. 214-2.500.

Westinghouse Air Brake Company: *See—*
Wilson, Richard L., 4,129,323, Cl. 285-69.000.

Westinghouse Electric Corp.: *See—*
Hine, Louis P., Jr., 4,129,013, Cl. 62-285.000.
MacDonald, Robert C., 4,129,199, Cl. 187-29.00R.
Rosa, John, 4,129,809, Cl. 318-293.000.
Spurgin, Anthony J.; and Schaefer, William F., 4,129,475, Cl. 176-22.000.

Westland Aircraft Limited: *See—*
Watson, Kenneth, 4,129,403, Cl. 416-134.00A.

Westley, John, to Hoffmann-La Roche Inc. Resolution of certain asymmetric primary amines using lasalocid. 4,129,580, Cl. 260-347.700.

Westman, Morton A., to American Cyanamid Company. Method for removing permanent dyes from hair and other keratinaceous materials. 4,129,415, Cl. 8-102.000.

Westvaco Corporation: *See—*
Bandy, Clarence L., Jr., 4,129,265, Cl. 242-58.200.
Gendron, Wilfred H., 4,129,214, Cl. 206-629.000.

Whetstone, Henry M. Charge forming and depositing method. 4,129,159, Cl. 141-1.000.

Whirlpool Corporation: *See—*
Czech, James I.; and Ruble, Ernest B., 4,128,935, Cl. 29-596.000.
Platt, Clark I., 4,129,018, Cl. 68-134.000.

White, Dwain M., to General Electric Company. Poly-phenylene oxide process employing aminophenol reactants. 4,129,555, Cl. 260-823.000.

White, Rollin T., to NJM, Inc. Package label and manufacture of same. 4,128,954, Cl. 40-310.000.

White, William I., to Miles Laboratories, Inc. Multisystem test means. 4,129,417, Cl. 23-230.00B.

Whiteside, George D., to Polaroid Corporation. Exposure control system. 4,129,367, Cl. 354-83.000.

Whiteside, George D.; and Johnson, Bruce K., to Polaroid Corporation. Last flash inhibit for magnet actuated scanning shutter blade arrangement. 4,129,368, Cl. 354-128.000.

Whittington, Billy J.; Burns, Timothy L.; and Welsh, Alan B., to Kimball International, Inc. Electronic organ with chord and tab switch setting programming and playback. 4,129,055, Cl. 84-1.010.

Wiechert, Rudolf; Bittler, Dieter; Kerb, Ulrich; Casals-Stenzel, Jorge; and Losert, Wolfgang, to Schering, A.G. Patentabteilung. Spirolactones. 4,129,564, Cl. 260-239.570.

Wied, George L.; Bahr, Gunter F.; and Puls, James H., to Miles Laboratories, Inc. Apparatus and method for preparing a particle suspension. 4,129,381, Cl. 356-36.000.

Wiesbrod, Sherman, to RCA Corporation. Image display device commutator. 4,129,804, Cl. 315-169.0TV.

Wiggins, Richard F., to Gyromat Corporation. Apparatus for spray coating. 4,129,092, Cl. 118-323.000.

Wilcock, John D.: *See—*
Dickson, John F.; and Wilcock, John D., 4,129,794, Cl. 307-270.000.

Wilhelm, Karlheinz: *See—*
Engels, Kaspar; and Wilhelm, Karlheinz, 4,129,261, Cl. 241-46.110.

Wilson, Phillip S.: *See—*
Axelrod, Robert J.; Mark, Victor; and Wilson, Phillip S., 4,129,546, Cl. 260-31.80T.

Wilson, Richard L., to Westinghouse Air Brake Company. Lockable hose coupling. 4,129,323, Cl. 285-69.000.

Wilts, James F.: *See—*
Lewis, Roger N.; Pastorino, Ronald L.; and Wilts, James F., 4,129,613, Cl. 260-861.000.

Winn, Donald L. Electric cord receptacle. 4,129,350, Cl. 339-99.00R.

Winters, Harry K.; and Chambers, Warren D., to Bendix Corporation, The. Aircraft brake torque limiter. 4,129,202, Cl. 188-181.00T.

Wisbey, Raymond W.: *See—*
Shotts, L. D.; Wisbey, Raymond W.; and Sears, Albert W., 4,128,928, Cl. 29-156.80B.

Wisconsin Alumni Research Foundation: *See—*
Ellison, Robert A.; and Kotsonis, Frank N., 4,129,577, Cl. 260-345.200.
Navratil, Gerald A.; and Neil, George R., 4,129,772, Cl. 219-121.00P.

Wisconsin Gas Company: *See—*
Chen, Keith A., 4,129,894, Cl. 361-117.000.

Witriol, Norman M.: *See—*
Roberts, Thomas G.; Rust, Charles M.; and Witriol, Norman M., 4,129,095, Cl. 119-5.000.

Wittenberg, Roland C., to Pickering & Company, Inc. Phonograph turntable electro-thermal cueing control. 4,129,305, Cl. 274-23.00R.

Witting, Harald L., to General Electric Company. Current wave shapes for jet engine fuel igniters. 4,129,895, Cl. 361-257.000.

Wix Corporation: *See—*
Humbert, Kingsley E., Jr.; and Judah, Lewis J., 4,129,429, Cl. 55-484.000.

Wizerkaniuk, Walter. Method of providing pellets with a water insoluble coating using a melt. 4,129,666, Cl. 427-3.000.

Wolfseder, Alfons; Urban, Hans; and Redl, Simon, to Anton Steinecker Maschinenfabrik GmbH. Vat for separating wort for spent grain. 4,129,504, Cl. 210-247.000.

Wood, Andrew, to British Gas Corporation. Coal gasification plant. 4,129,422, Cl. 48-62.00R.

Wood, Gary F. Method and apparatus for grain drying and storage. 4,128,948, Cl. 34-33.000.

Wood, Richard F.: *See—*
Cleland, John W.; Westbrook, Russell D.; Wood, Richard F.; and Young, Rosa T., 4,129,463, Cl. 148-33.000.

Woodings, Calvin R., to Courtaulds Limited. Multi-limbed regenerated cellulose filaments. 4,129,679, Cl. 428-398.000.

Woodstream Corporation: *See—*
Conibear, Frank, 4,128,961, Cl. 43-88.000.

Wortley, John P. A.: *See—*
Morton, Peter H.; Gilbert, John R. B.; and Wortley, John P. A., 4,129,492, Cl. 204-212.000.

Wozar, T. M. Trepanning tool. 4,129,400, Cl. 408-56.000.

Wright, Harold A., to ARCO Polymers, Inc. Bead size distribution in the suspension polymerization of vinyl aromatic monomers employing aminoalkanesulfonic acids. 4,129,707, Cl. 526-204.000.

Wrycraft, Norman E.; and Collins, Alistair K., to Vulcan Industrial Packaging Limited. Container with spout connection. 4,129,236, Cl. 222-570.000.

Wulk, Peter K.: *See—*
Kisselow, Alexander W.; and Wulk, Peter K., 4,129,512, Cl. 252-51.50A.

Wunsche, Joachim: *See—*
Thonnes, Horst; and Wunsche, Joachim, 4,129,022, Cl. 72-41.000.

Wyatt, William G. Radiant energy collector. 4,129,115, Cl. 126-270.000.

Wyman, Donald P.: *See—*
Lorenz, Donald H.; Tu, Shu-Tung; and Wyman, Donald P., 4,129,667, Cl. 427-44.000.

Wynn, James M. Check valve assembly. 4,129,145, Cl. 137-541.000.

Xerox Corporation: *See—*
Infante, Carlo, 4,129,807, Cl. 315-387.000.
Turner, Sam R., 4,129,581, Cl. 260-348.450.

Yablochnikov, Boris A. Inductor for magnetic pulse working of tubular metal articles. 4,129,846, Cl. 336-84.00C.

Yamada, Takahiro: *See—*
Ito, Syoichi; and Yamada, Takahiro, 4,129,875, Cl. 346-75.000.

Yamaguchi, Takao: *See—*
Etchu, Masami; Yamaguchi, Takao; and Takagi, Norio, 4,129,630, Cl. 264-22.000.

Yamaguchi, Tetsuo: *See—*
Kudo, Ken-ichi; Kitawaga, Yoshihiko; Koyama, Teruhisa; Takata, Akira; Kanagawa, Shuichi; and Yamaguchi, Tetsuo, 4,129,557, Cl. 526-283.000.

Yamamichi, Masayoshi; Iura, Yukio; Tezuka, Nobuo; Watanabe, Satoshi; Uchidoi, Masanori; and Aizawa, Hiroshi, to Canon Kabushiki Kaisha. Photographic camera having electromagnetic operation control. 4,129,877, Cl. 354-271.000.

Yamamoto, Shinji: *See—*
Suzuki, Ryuichi; Hashizume, Akihide; Horiuchi, Hideyuki; Yamamoto, Shinji; and Yokouchi, Hisatake, 4,129,854, Cl. 340-146.3CA.

Yamane, Izumi: *See—*
Ogoshi, Toshiaki; Nakamura, Masayoshi; and Yamane, Izumi, 4,129,511, Cl. 252-140.000.

Yamaya, Hiroshi: *See—*
Sugimoto, Kazuyasu; Yamaya, Hiroshi; and Ishimoto, Kameki, 4,129,351, Cl. 339-176.0MP.

Yamazaki, Katsuhiro: *See—*
Inano, Tozaburo; Yamazaki, Katsuhiro; and Otake, Minoru, 4,129,774, Cl. 219-552.000.

Yang, Kei-Hsiung: *See—*
Kingsley, Jack D.; and Yang, Kei-Hsiung, 4,129,779, Cl. 250-315.00A.

Yankee, Ernest W., to Upjohn Company, The. Cis-4,5-didehydro-cis-13-$PGE_1$, compounds. 4,129,582, Cl. 260-408.000.

Yanovsky, Jury G.: *See—*
Nametkin, Nikolai S.; Vinogradov, Georgy V.; Podolsky, Jury Y.; Pavlovskaya, Nina T.; Frenkin, Ernest I.; and Yanovsky, Jury G., 4,129,550, Cl. 260-42.220.

Yasuda, Takashi: *See*—
Saikawa, Isamu; Takano, Shuntaro; Imaizumi, Hiroyuki; Takakura, Isamu; Ochiai, Hirokazu; Yasuda, Takashi; Taki, Hideo; Tai, Masaru; and Kodama, Yutaka, 4,129,730, Cl. 544-21.000.

Yasuike, Akio; Kataoka, Hiroshi; and Toyouchi, Kaoru, to Asahi-Dow Limited. Method for producing foamed moldings from synthetic resin materials. 4,129,635, Cl. 264-45.500.

Yazaki, Mituyoshi: *See*—
Ogoshi, Toshiaki; Nakamura, Masayoshi; and Yazaki, Mituyoshi, 4,129,526, Cl. 252-536.000.

Yee, Kenneth W.: *See*—
Carpenter, Robert J.; and Yee, Kenneth W., 4,129,864, Cl. 340-347.0AD.

Yew, Ming-Chih; and Jones, Trevor O., to General Motors Corporation. Stepped voltage power supply with equalized discharge of battery cells. 4,129,817, Cl. 320-18.000.

Yin, Ching-Feng: *See*—
Heyn, Fred M.; Yin, Ching-Feng; Hanson, Gordon L.; and Schreck, Robert C., 4,129,176, Cl. 165-7.000.

Yoke, James H. Solar energy collector. 4,129,119, Cl. 126-271.000.

Yokota, Shinichi: *See*—
Nakahara, Yasushi; Ohtomo, Tadasuke; Yokota, Shinichi; and Usui, Kazuo, 4,129,008, Cl. 405-303.000.

Yokouchi, Hisatake: *See*—
Suzuki, Ryuichi; Hashizume, Akihide; Horiuchi, Hideyuki; Yamamoto, Shinji; and Yokouchi, Hisatake, 4,129,854, Cl. 340-146.3CA.

Yokoyama, Akinori; and Morinaka, Iwao, to Kabushiki Kaisha Komatsu Seisakusho. Hydraulic torque converter with a lock-up clutch and an axially retractable reactor. 4,128,999, Cl. 60-347.000.

Yokoyama, Akinori: *See*—
Umeda, Haruhiko; Ito, Ryuji; Yokoyama, Akinori; and Komatsu, Mitsuaki, 4,129,000, Cl. 60-361.000.

Yonezawa, Setsuo; Kawakami, Tsuneta; Shimada, Tatsuo; and Chida, Yoshinori, to Kabushiki Kaisha Seikosha. Apparatus for forming a character by a matrix pattern of picture elements. 4,129,860, Cl. 340-324.0AD.

Yoshida Kogyo K.K.: *See*—
Matsubara, Isamu, 4,128,983, Cl. 52-731.000.

Yoshida, Ryo: *See*—
Takemoto, Ichiki; Yoshida, Ryo; Sumida, Seizo; and Kamoshita, Katsuzo, 4,129,436, Cl. 71-120.000.

Yoshida, Shigeki: *See*—
Kawagai, Kenji; and Yoshida, Shigeki, 4,129,792, Cl. 307-270.000.

Yoshino, Hisashi: *See*—
Okutomi, Tsutomu; Yoshino, Hisashi; and Chiba, Seishi, 4,129,760, Cl. 200-144.00B.
Okutomi, Tsutomu; Yoshino, Hisashi; Chiba, Seishi; Tsutsumi, Tadahito; and Tejima, Kouichi, 4,129,761, Cl. 200-144.00B.

Yotsukura, Teruo, to Hitachi, Ltd. Electrophotographic apparatus. 4,129,376, Cl. 355-11.000.

Young, Dean A., to Union Oil Company of California. Arsenic containing fuels. 4,129,409, Cl. 431-3.000.

Young, John W., to Gould Inc. Meter retainer. 4,129,896, Cl. 361-371.000.

Young, Rosa T.: *See*—
Cleland, John W.; Westbrook, Russell D.; Wood, Richard F.; and Young, Rosa T., 4,129,463, Cl. 148-33.000.

Yu, Se P.: *See*—
Tantraporn, Wirojana; and Yu, Se P., 4,129,879, Cl. 357-22.000.

Zaitseva, Nina E., administrator: *See*—
Ignashev, Evgeny P.; Konovalov, Evmeny G., deceased; Konovalov, Georgy E., administrator; and Zaitseva, Nina E., administrator, 4,129,027, Cl. 72-429.000.

Zengel, Hans; and Bergfeld, Manfred, to Akzona Incorporated. Process for the preparation of para-nitroso-diphenylhydroxylamines. 4,129,740, Cl. 560-48.000.

Zenith Radio Corporation: *See*—
Chovanec, Donald D., 4,129,885, Cl. 358-190.000.

Zingheim, Steven C., to Raychem Corporation. Polymeric compositions containing brominated flame retardants. 4,129,616, Cl. 260-878.00R.

Zoltobrocki, Manfred, to Hoechst Aktiengesellschaft. Process for the purification of high molecular weight peptides using non-ionic detergents. 4,129,560, Cl. 260-112.00R.

Zondek, Klaus. Process for separating crystallizable fractions from mixtures thereof. 4,129,583, Cl. 260-428.500.

Zondler, Helmut; and Moser, Roland, to Ciba-Geigy Corporation. Curable epoxide resin mixtures. 4,129,556, Cl. 528-97.000.

Zuna, Jaroslav: *See*—
Reichel, Pavel; Kafunek, Pavel; Kovar, Jiri; Pokorny, Oldrich; Zuna, Jaroslav; Kratina, Jindrich; and Pellant, Michal, 4,129,881, Cl. 357-82.000.

Zweegers, Petrus W. Agricultural implements. 4,128,987, Cl. 56-377.000.

# LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 12TH DAY OF DECEMBER, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Perkin-Elmer Corporation, The: *See*—
Scott, Larkin B., Re. 29,860, Cl. 323-43.50R.

Scott, Larkin B., to Perkin-Elmer Corporation, The. Rotary potentiometer with speed reduction gearing. Re. 29,860, Cl. 323-43.50R.

# LIST OF PLANT PATENTEES

Framptons Nurseries Limited: *See*—
Machin, Barrie J., 4,346, Cl. 80.000.

Hope, Claude, to Pan-American Plant Company. Kalanchoe plant named Toltec. 4,342, 12-12-78, Cl. 68.000.

Hope, Claude, to Pan-American Plant Company. Kalanchoe plant named Goddess. 4,343, 12-12-78, Cl. 68.000.

Hope, Claude, to Pan-American Plant Company. Kalanchoe named Montezuma. 4,344, 12-12-78, Cl. 68.000.

Hope, Claude, to Pan-American Plant Company. Kalanchoe named Tabasco. 4,345, 12-12-78, Cl. 68.000.

Machin, Barrie J., to Framptons Nurseries Limited. Chrysanthemum plant. 4,346, 12-12-78, Cl. 80.000.

Pan-American Plant Company: *See*—
Hope, Claude, 4,342, Cl. 68.000.
Hope, Claude, 4,343, Cl. 68.000.
Hope, Claude, 4,344, Cl. 68.000.
Hope, Claude, 4,345, Cl. 68.000.

Ranks Hovis McDougall Limited: *See*—
Solomons, Gerald L.; and Scammell, Gerald W., 4,347, Cl. 89.000.

Scammell, Gerald W.: *See*—
Solomons, Gerald L.; and Scammell, Gerald W., 4,347, Cl. 89.000.

Solomons, Gerald L.; and Scammell, Gerald W., to Ranks Hovis McDougall Limited. Non-toxic strain of *Fusarium graminearum*. 4,347, 12-12-78, Cl. 89.000.

# LIST OF DESIGN PATENTEES

Abbott Laboratories: *See*—
Bujan, Albert F., 250,510, Cl. D8-40.000.

Affleck, Lyle C. Sealing liner for a closure. 250,511, 12-12-78, Cl. D9-254.000.

Anchor Hocking Corporation: *See*—
Gobleck, Peter A., Jr., 250,506, Cl. D7-54.000.

Belokin, Paul, Jr. Illuminated overhead advertising display. 250,555, 12-12-78, Cl. D96-12.00R.

Bender, Keith N.: *See*—
Chinn, Roger A.; Chinn, Edna A.; Blaser, John E.; and Bender, Keith N., 250,541, Cl. D23-97.000.

Blaser, John E.: *See*—
Chinn, Roger A.; Chinn, Edna A.; Blaser, John E.; and Bender, Keith N., 250,541, Cl. D23-97.000.

Bliss & Laughlin Industries Incorporated: *See*—
Pinaire, Lon W.; and Godwin, Robert H., 250,501, Cl. D6-191.000.

Bourke, Robert E., to Lykes Pasco Packing Co. Beverage dispenser. 250,536, 12-12-78, Cl. D15-116.000.

Breitschwerdt, Werner; and Langenbeck, Andreas, to Daimler-Benz Aktiengesellschaft. Car top carrier for winter sports equipment. 250,526, 12-12-78, Cl. D12-157.000.

Bujan, Albert F., to Abbott Laboratories. Opening tool for tear-open-type containers. 250,510, 12-12-78, Cl. D8-40.000.

Chinn, Edna A.: *See*—
Chinn, Roger A.; Chinn, Edna A.; Blaser, John E.; and Bender, Keith N., 250,541, Cl. D23-97.000.

Chinn, Roger A.; Chinn, Edna A.; Blaser, John E.; and Bender, Keith N., to Woodcutter's Manufacturing, Inc. Wood burning stove with door. 250,541, 12-12-78, Cl. D23-97.000.

Clivio, Franco; and Raffler, Dieter, to Gardena kress & Kastner GmbH. Shaft coupling for garden tools. 250,508, 12-12-78, Cl. D8-1.000.

Colatriano, William M., to Hercules Incorporated. Furniture subframe. 250,503, 12-12-78, Cl. D6-195.000.

Daimler-Benz Aktiengesellschaft: *See*—
Breitschwerdt, Werner; and Langenbeck, Andreas, 250,526, Cl. D12-157.000.
Sacco, Bruno; and Gotz, Hans, 250,527, Cl. D12-181.000.

Demetreon, James. Battery terminal connector. 250,531, 12-12-78, Cl. D13-10.000.

Denaro, Joseph M.: *See*—
Pick, Ernest W.; Denaro, Joseph M.; and Goerke, Henry R., 250,546, Cl. D24-60.000.

Detroit Tool and Engineering Company: *See*—
Miner, Earl L.; and Jones, Harold G., 250,522, Cl. D12-1.000.

Esselte Obergs AB: *See*—
Winther, Ole, 250,552, Cl. D87-1.00D.

Etchison, Richard C. Gauge mount slide for test stand. 250,513, 12-12-78, Cl. D10-83.000.

Etchison, Richard C. Coil spring test stand. 250,514, 12-12-78, Cl. D10-83.000.

Etchison, Richard C. Spring seat for test stand. 250,515, 12-12-78, Cl. D10-83.000.

Fangel & Co. A/S: *See*—
Myhre, Jon, 250,553, Cl. D87-1.00R.

Fishman, Martin. Earring. 250,517, 12-12-78, Cl. D11-67.000.

Fishman, Martin B. Earring. 250,516, 12-12-78, Cl. D11-49.000.

Friedman, David. Jewelry medallion or similar article. 250,518, 12-12-78, Cl. D11-108.000.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Murakami, Hisao, 250,542, Cl. D23-150.000.

Gardena kress & Kastner GmbH: *See*—
Clivio, Franco; and Raffler, Dieter, 250,508, Cl. D8-1.000.

Gobleck, Peter A., Jr., to Anchor Hocking Corporation. Condiment shaker or similar article. 250,506, 12-12-78, Cl. D7-54.000.

Godwin, Robert H.: *See*—
Pinaire, Lon W.; and Godwin, Robert H., 250,501, Cl. D6-191.000.

Goerke, Henry R.: *See*—
Pick, Ernest W.; Denaro, Joseph M.; and Goerke, Henry R., 250,546, Cl. D24-60.000.

Gotz, Hans: *See*—
Sacco, Bruno; and Gotz, Hans, 250,527, Cl. D12-181.000.

Hardy, Sheila. Cane. 250,554, 12-12-78, Cl. D88-5.000.

Hart, Victor R. Handle for a faucet. 250,538, 12-12-78, Cl. D23-28.000.

Hashimoto, Hideo. Artificial tree. 250,519, 12-12-78, Cl. D11-118.000.

Heavener, Paul R. Plaque. 250,520, 12-12-78, Cl. D11-140.000.

Hercules Incorporated: *See*—
Colatriano, William M., 250,503, Cl. D6-195.000.
Trimble, David C., 250,502, Cl. D6-195.000.

Hosford, Charles D.; and Simpson, Barry. Folding stool. 250,498, 12-12-78, Cl. D6-32.000.

Hurst, Eric K., to Lewis Woolf Griptight Limited. Teat. 250,545, 12-12-78, Cl. D24-47.000.

Jones, Harold G.: *See*—
Miner, Earl L.; and Jones, Harold G., 250,522, Cl. D12-1.000.

Kato, Akira, to Sansui Electric Co., Ltd. Combined tuner and amplifier. 250,534, 12-12-78, Cl. D14-96.000.

Kato, Akira, to Sansui Electric Co., Ltd. Combined tuner and amplifier. 250,535, 12-12-78, Cl. D14-96.000.

Kaye, Gordon E., to P.R. Mallory & Co. Inc. Electric cartridge battery. 250,528, 12-12-78, Cl. D13-8.000.

Kaye, Gordon E., to P.R. Mallory & Co. Inc. Electric cartridge battery. 250,529, 12-12-78, Cl. D13-8.000.

Kaye, Gordon E., to P.R. Mallory & Co. Inc. Electric cartridge battery. 250,530, 12-12-78, Cl. D13-8.000.

King-Seeley Thermos Company: *See*—
Seager, Richard H., 250,505, Cl. D7-40.000.

Kliot, Jules. Picture frame. 250,504, 12-12-78, Cl. D6-242.000.
Langenbeck, Andreas: *See—*
Breitschwerdt, Werner; and Langenbeck, Andreas, 250,526, Cl. D12-157.000.
Lanier Business Products, Inc.: *See—*
Walz, David K., 250,532, Cl. D14-3.000.
Leonard, Henri, to Micro-Mega S.A. Dental root-canal broach. 250,544, 12-12-78, Cl. D24-10.000.
Lewis, James H. Liquid sterilizer assembly. 250,543, 12-12-78, Cl. D24-9.000.
Lewis Woolf Griptight Limited: *See—*
Hurst, Eric K., 250,545, Cl. D24-47.000.
Lowe, Brian A.: *See—*
Odell, Raymond; and Lowe, Brian A., 250,496, Cl. D2-233.000.
Luscombe, Arthur J. Wood-burning stove. 250,540, 12-12-78, Cl. D23-97.000.
Lykes Pasco Packing Co.: *See—*
Bourke, Robert E., 250,536, Cl. D15-116.000.
MacIntyre, John A. Protective security hatch cover for sailboats or the like. 250,523, 12-12-78, Cl. D12-70.000.
Marks, Philip. Display rack. 250,500, 12-12-78, Cl. D6-85.000.
Maza, Dale T.: *See—*
Raftery, William B.; Maza, Dale T.; and Tomblin, Glen E., 250,507, Cl. D7-187.000.
McCraney, Charles E. Flag. 250,521, 12-12-78, Cl. D11-176.000.
McIntyre, Emmett D.: *See—*
O'Gwin, Ray J., Jr.; and McIntyre, Emmett D., 250,499, Cl. D6-83.000.
Micro-Mega S.A.: *See—*
Leonard, Henri, 250,544, Cl. D24-10.000.
Miner, Earl L.; and Jones, Harold G., to Detroit Tool and Engineering Company. Self-propelled personnel and material carrying vehicle. 250,522, 12-12-78, Cl. D12-1.000.
Murakami, Hisao, to Fujisawa Pharmaceutical Co., Ltd. Container for solid air freshener. 250,542, 12-12-78, Cl. D23-150.000.
Myhre, Jon, to Fangel & Co. A/S. Geological specimen case. 250,553, 12-12-78, Cl. D87-1.00R.
Normart, Martin. Gameboard. 250,551, 12-12-78, Cl. D34-5.0SS.
Nyblom, Raimo, to Oy Nokia AB. Tire. 250,524, 12-12-78, Cl. D12-146.000.
Odell, Raymond; and Lowe, Brian A. Head seal for an anti-dust helmet. 250,496, 12-12-78, Cl. D2-233.000.
O'Gwin, Ray J., Jr.; and McIntyre, Emmett D. Bunkbed. 250,499, 12-12-78, Cl. D6-83.000.
Oy Nokia AB: *See—*
Nyblom, Raimo, 250,524, Cl. D12-146.000.
P.R. Mallory & Co. Inc.: *See—*
Kaye, Gordon E., 250,528, Cl. D13-8.000.
Kaye, Gordon E., 250,529, Cl. D13-8.000.
Kaye, Gordon E., 250,530, Cl. D13-8.000.
Palmer, Thomas E., to Wilkinson Sword Limited. Razor. 250,547, 12-12-78, Cl. D28-46.000.
Pick, Ernest W.; Denaro, Joseph M.; and Goerke, Henry R., to Purdue Frederick Company, The. Douche appliance. 250,546, 12-12-78, Cl. D24-60.000.
Pinaire, Lon W.; and Godwin, Robert H., to Bliss & Laughlin Industries Incorporated. Compact chair-tilting control. 250,501, 12-12-78, Cl. D6-191.000.
Plimmer, Frederick W., to Wilkinson Sword Limited. Pair of secateurs. 250,509, 12-12-78, Cl. D8-5.000.
Purdue Frederick Company, The: *See—*
Pick, Ernest W.; Denaro, Joseph M.; and Goerke, Henry R., 250,546, Cl. D24-60.000.
Raffler, Dieter: *See—*
Clivio, Franco; and Raffler, Dieter, 250,508, Cl. D8-1.000.
Raftery, William B.; Maza, Dale T.; and Tomblin, Glen E. Mop wringer. 250,507, 12-12-78, Cl. D7-187.000.
Renard, Marc, to Societe Peritel S.A.R.L. Automatic telephone dialer. 250,533, 12-12-78, Cl. D14-66.000.
Reverchon, Gaston. Amusement bumper car. 250,550, 12-12-78, Cl. D34-5.00L.
Rips, Irving; and Vine, Kemper H., to Younger Manufacturing Company. Lens calibration gauge. 250,512, 12-12-78, Cl. D10-64.000.
Rocheleau, Georges A.; and Rouillard, Florien. Hat. 250,497, 12-12-78, Cl. D2-253.000.
Rost, Gabriele. Make-up case. 250,548, 12-12-78, Cl. D28-79.000.
Rouillard, Florien: *See—*
Rocheleau, Georges A.; and Rouillard, Florien, 250,497, Cl. D2-253.000.
Sacco, Bruno; and Gotz, Hans, to Daimler-Benz Aktiengesellschaft. Air guide for motor vehicle rear windows. 250,527, 12-12-78, Cl. D12-181.000.
Sansui Electric Co., Ltd.: *See—*
Kato, Akira, 250,534, Cl. D14-96.000.
Kato, Akira, 250,535, Cl. D14-96.000.
Seager, Richard H., to King-Seeley Thermos Company. Insulated cover for a food tray or the like. 250,505, 12-12-78, Cl. D7-40.000.
Simpson, Barry: *See—*
Hosford, Charles D.; and Simpson, Barry, 250,498, Cl. D6-32.000.
Snyder, Stanley G. Van top. 250,525, 12-12-78, Cl. D12-156.000.
Societe Peritel S.A.R.L.: *See—*
Renard, Marc, 250,533, Cl. D14-66.000.
Stephens, Ronald M. Moistener for stamp or the like. 250,537, 12-12-78, Cl. D19-70.000.
Stoddard, Charles W. Saddle. 250,549, 12-12-78, Cl. D30-20.000.
Tomblin, Glen E.: *See—*
Raftery, William B.; Maza, Dale T.; and Tomblin, Glen E., 250,507, Cl. D7-187.000.
Trimble, David C., to Hercules Incorporated. Furniture subframe. 250,502, 12-12-78, Cl. D6-195.000.
Twiss, Norman W.; and Twiss, Norman W. Free standing stove. 250,539, 12-12-78, Cl. D23-97.000.
Twiss, Norman W.: *See—*
Twiss, Norman W.; and Twiss, Norman W., 250,539, Cl. D23-97.000.
Vine, Kemper H.: *See—*
Rips, Irving; and Vine, Kemper H., 250,512, Cl. D10-64.000.
Walz, David K., to Lanier Business Products, Inc. Dictation station or the like. 250,532, 12-12-78, Cl. D14-3.000.
Wilkinson Sword Limited: *See—*
Palmer, Thomas E., 250,547, Cl. D28-46.000.
Plimmer, Frederick W., 250,509, Cl. D8-5.000.
Winther, Ole, to Esselte Obergs AB. Carrying case for tape cassettes. 250,552, 12-12-78, Cl. D87-1.00D.
Woodcutter's Manufacturing, Inc.: *See—*
Chinn, Roger A.; Chinn, Edna A.; Blaser, John E.; and Bender, Keith N., 250,541, Cl. D23-97.000.
Younger Manufacturing Company: *See—*
Rips, Irving; and Vine, Kemper H., 250,512, Cl. D10-64.000.

# CLASSIFICATION OF PATENTS

## ISSUED DECEMBER 12, 1978

NOTE.—First number, class; second number, subclass; third number, patent number

**CLASS 2**

2 4,128,902

**CLASS 3**

19 4,128,903

**CLASS 4**

185 L 4,128,904
187 R 4,128,905
325 4,128,906

**CLASS 5**

200 R 4,128,907
334 C 4,128,908

**CLASS 8**

1 W 4,129,412
10.2 4,129,413
4,129,414
102 4,129,415
115 4,129,416

**CLASS 10**

238 4,129,081

**CLASS 13**

2 P 4,129,742

**CLASS 15**

104 A 4,128,909
110 4,128,910
167 R 4,128,911
246 4,128,913
257.7 4,128,912

**CLASS 16**

1 R 4,128,914

**CLASS 17**

32 4,128,915
52 4,128,916

**CLASS 19**

105 4,128,917

**CLASS 23**

230 B 4,129,417

**CLASS 24**

16 R 4,128,918
20 TT 4,128,919
30.5 R 4,128,922
201 B 4,128,920
221 R 4,128,923
230 AL 4,128,924
279 4,128,921

**CLASS 29**

25.2 4,128,925
25.42 4,128,926
4,128,927
156.8 B 4,128,928
4,128,929
213 R 4,128,930
239 4,128,931
401 R 4,128,932
420.5 4,128,933
460 4,128,934
596 4,128,935
630 R 4,128,936

**CLASS 30**

47 4,128,937
120.3 4,128,938
123 4,128,939
151 4,128,941
373 4,128,940

**CLASS 32**

32 4,128,942

**CLASS 33**

174 Q 4,128,943
180 R 4,128,944
181 R 4,128,945

**CLASS 34**

12 4,128,946
4,128,947
33 4,128,948

**CLASS 35**

39 4,128,949

**CLASS 36**

30 R 4,128,950
44 4,128,951

**CLASS 37**

8 4,128,952

**CLASS 38**

56 4,128,953

**CLASS 40**

310 4,128,954
489 4,128,955

**CLASS 42**

23 4,128,956
65 4,128,957

**CLASS 43**

3 4,128,958
27.4 4,128,960
43.13 4,128,959
88 4,128,961

**CLASS 44**

51 4,129,420
56 4,129,421

**CLASS 46**

7 4,128,962
43 4,128,964

**CLASS 47**

47 4,128,965
69 4,128,966

**CLASS 48**

62 R 4,129,422

**CLASS 49**

318 4,128,967

**CLASS 51**

54 4,128,968
106 R 4,128,969
170 TL 4,128,970
204 4,128,971
298 R 4,128,972
304 4,129,423

**CLASS 52**

2 4,128,973
11 4,128,974
125 4,128,975
187 4,128,976
212 4,128,977
232 4,128,978
241 4,128,979
251 4,128,980
309.3 4,128,981
367 4,128,982
731 4,128,983
746 4,128,984

**CLASS 53**

51 4,128,985

**CLASS 55**

25 4,129,424
44 4,129,425
217 4,129,426
247 4,129,427
379 4,129,428
484 4,129,429
485 4,129,430

**CLASS 56**

328 TS 4,128,986
377 4,128,987

**CLASS 57**

66 4,128,988
247 4,128,989

**CLASS 58**

2 4,128,990
23 D 4,128,992
23 R 4,128,991
4,128,993

**CLASS 60**

39.05 4,128,994
204 4,128,995
205 4,128,996
274 4,128,997
277 4,128,998
347 4,128,999
361 4,129,000
403 4,129,001
633 4,129,002
645 4,129,003
652 4,129,004
715 4,129,005

**CLASS 62**

66 4,129,431
113 4,129,012
222 4,129,432
285 4,129,013
333 4,129,014
344 4,129,015

**CLASS 64**

17 A 4,129,016

**CLASS 65**

2 4,129,433
60 D 4,129,434

**CLASS 68**

15 4,129,017
134 4,129,018

**CLASS 70**

107 4,129,019
417 4,129,020
456 R 4,129,021

**CLASS 71**

65 4,129,435
120 4,129,436

**CLASS 72**

41 4,129,022
235 4,129,023
329 4,129,024
348 4,129,025
367 4,129,026
429 4,129,027
430 4,129,028

**CLASS 73**

19 4,129,029
23 4,129,030
32 A 4,129,031
117.3 4,129,034
136 B 4,129,035
140 4,129,036
151 4,129,037
307 4,129,038
310 4,129,039
507 4,129,040
657 4,129,041
727 4,129,042
772 4,129,033

**CLASS 74**

219 4,129,043
244 4,129,044
255 R 4,129,045
473 P 4,129,046
474 4,129,047
612 4,129,048
625 4,129,049
750 R 4,129,050
867 4,129,051

**CLASS 75**

5 4,129,437
10 C 4,129,438
58 4,129,439
63 4,129,440
118 R 4,129,441
126 C 4,129,442
212 4,129,443
251 4,129,444

**CLASS 76**

107 A 4,129,052

**CLASS 83**

69 4,129,053
165 4,129,054

**CLASS 84**

1.01 4,129,055
1.26 4,129,056
434 4,129,057
485 R 4,129,058

**CLASS 85**

49 4,129,059
53 4,129,060

**CLASS 86**

20 B 4,129,061

**CLASS 90**

11 R 4,129,062

**CLASS 91**

506 4,129,063

**CLASS 92**

129 4,129,064

**CLASS 93**

33 R 4,129,032
58 ST 4,129,065

**CLASS 96**

29 R 4,129,445
74 4,129,446

**CLASS 99**

345 4,129,066
391 4,129,067
538 4,129,068
646 S 4,129,069

**CLASS 100**

17 4,129,070
53 4,129,071

**CLASS 101**

1 4,129,072
2 4,129,073
35 4,129,074
99 4,129,075
127 4,129,076
350 4,129,077

**CLASS 102**

89 CD 4,129,078

**CLASS 105**

368 B 4,129,079

**CLASS 106**

2 4,129,447
15 R 4,129,448
95 4,129,449
120 4,129,450
168 4,129,451
243 4,129,452
287.32 4,129,453
304 4,129,454
308 N 4,129,455

**CLASS 108**

149 4,129,080

**CLASS 111**

7 4,129,082

**CLASS 112**

178 4,129,083
221 4,129,084

**CLASS 113**

121 C 4,129,085

**CLASS 114**

23 4,129,086
144 E 4,129,087

**CLASS 115**

18 E 4,129,088
28 A 4,129,089

**CLASS 118**

49 4,129,090
50 4,129,091
323 4,129,092
401 4,129,093

**CLASS 119**

1 4,129,094
5 4,129,095
27 4,129,096
28 4,129,097

**CLASS 122**

4 D 4,129,098

**CLASS 123**

32 EE 4,129,099
32 L 4,129,100
41.56 4,129,101
51 B 4,129,102
52 R 4,129,103
117 A 4,129,104
119 EC 4,129,105
136 4,129,106
146.5 A 4,129,107
193 P 4,129,108
198 F 4,129,109

**CLASS 124**

16 4,129,110

**CLASS 126**

25 AA 4,129,111
121 4,129,112
4,129,113
122 4,129,114
270 4,129,115
4,129,116
271 4,129,117
4,129,118
4,129,119
4,129,120
299 D 4,129,121

**CLASS 128**

1 R 4,129,122
4,129,123
2.05 R 4,129,125
2.05 T 4,129,124
80 A 4,129,126
89 R 4,129,127
133 4,129,128
214 R 4,129,129
218 P 4,129,130
276 4,129,131
287 4,129,132
419 PG 4,129,133

**CLASS 131**

2 4,129,134
243 4,129,135

**CLASS 134**

1 4,129,456
2 4,129,136
4,129,457
144 4,129,137
145 4,129,138

**CLASS 135**

3 E 4,129,139

**CLASS 136**

89 PC 4,129,458

**CLASS 137**

124 4,129,140
462 4,129,141
492 4,129,142
496 4,129,143
541 4,129,144
4,129,145
587 4,129,146
596 4,129,148
596.1 4,129,147
599.1 4,129,149
872 4,129,150

**CLASS 138**

89 4,129,151
154 4,129,152

**CLASS 139**

28 4,129,153
110 4,129,154
448 4,129,155

**CLASS 140**

92.4 4,129,156
123.6 4,129,157
149 4,129,158

**CLASS 141**

1 4,129,159
388 4,129,160

**CLASS 148**

4 4,129,459
9 R 4,129,460
12.3 4,129,461
31 4,129,462
33 4,129,463
162 4,129,464

**CLASS 149**

19.3 4,129,465

**CLASS 152**

225 R 4,129,161
354 RB 4,129,162

**CLASS 156**

48 4,129,466
84 4,129,467
148 4,129,468
155 4,129,470
157 4,129,469
211 4,129,471
331 4,129,472
364 4,129,473
394 4,129,474

**CLASS 160**

135 4,129,163

**CLASS 164**

7 4,129,164
4,129,165
46 4,129,166
4,129,167
159 4,129,168
166 4,129,169
270 4,129,170
292 4,129,171
348 4,129,172
442 4,129,173
443 4,129,174
444 4,129,175

**CLASS 165**

7 4,129,176
48 S 4,129,177
61 4,129,178
101 4,129,179
113 4,129,180
133 4,129,181

**CLASS 166**

263 4,129,182
300 4,129,183
315 4,129,184

**CLASS 169**

62 4,129,185

**CLASS 171**

83 4,129,186

**CLASS 173**

117 4,129,187
120 4,129,188

**CLASS 174**

38 4,129,743
94 R 4,129,744
209 4,129,745

**CLASS 176**

22 4,129,475
37 4,129,476
73 4,129,477

**CLASS 177**

123 4,129,189
155 4,129,190
210 R 4,129,191

**CLASS 178**

18 4,129,746
19 4,129,747
69.1 4,129,748

**CLASS 179**

2 EB 4,129,749
15 AL 4,129,750
15 BS 4,129,755
15 BW 4,129,751
146 E 4,129,752
170.2 4,129,753
175.2 R 4,129,756
188 4,129,754

**CLASS 180**

5 R 4,129,193
6.48 4,129,192
68.5 4,129,194

**CLASS 181**

167 4,129,195
280 4,129,196

**CLASS 182**

82 4,129,197
187 4,129,198

**CLASS 187**

29 R 4,129,199

**CLASS 188**

71.1 4,129,200
76 4,129,201
181 T 4,129,202

**CLASS 191**

48 4,129,203

**CLASS 192**

89 B 4,129,204

**CLASS 195**

100 4,129,483

**CLASS 198**

358 4,129,205
377 4,129,206
445 4,129,207
626 4,129,208
712 4,129,209

**CLASS 200**

4 4,129,757
5 A 4,129,758
83 R 4,129,759
144 B 4,129,760
4,129,761
153 G 4,129,762
159 A 4,129,763
159 R 4,129,764
268 4,129,765
308 4,129,766

**CLASS 204**

1 T 4,129,478
4,129,479
4,129,480
1.5 4,129,481
43 T 4,129,482
101 4,129,484
144.5 4,129,485
159.14 4,129,487
159.19 4,129,486
4,129,488
159.22 4,129,489
181 C 4,129,490
195 S 4,129,491
212 4,129,492
228 4,129,493
268 4,129,494
279 4,129,495

**CLASS 206**

45.31 4,129,210
213.1 4,129,211
450 4,129,212
575 4,129,213
629 4,129,214

**CLASS 208**

134 4,129,496
138 4,129,497

**CLASS 209**

213 4,129,498
610 4,129,215

**CLASS 210**

23 R 4,129,499
4,129,500
4,129,501
60 4,129,502
232 4,129,503
247 4,129,504

**CLASS 211**

13 4,129,216
95 4,129,217
116 4,129,218

**CLASS 213**

100 R 4,129,219

**CLASS 214**

1.4 4,129,220
2.5 4,129,221
17 D 4,129,222
620 4,129,223
763 4,129,224

**CLASS 215**

12 R 4,129,225
235 4,129,226

**CLASS 217**

55 4,129,787

**CLASS 219**

10.49 R 4,129,767
10.55 A 4,129,768
10.55 B 4,129,769
98 4,129,770
104 4,129,771
121 P 4,129,772
146.23 4,129,773
552 4,129,774

**CLASS 220**

267 4,129,227
293 4,129,228

**CLASS 221**

129 4,129,229
268 4,129,230

**CLASS 222**

145 4,129,231
173 4,129,232
227 4,129,233
235 4,129,234
321 4,129,235
570 4,129,236

**CLASS 224**

5 C 4,129,237

**CLASS 226**

29 4,129,238
75 4,129,239

**CLASS 227**

8 4,129,240

**CLASS 228**

113 4,129,241
121 4,129,242
122 4,129,243
170 4,129,244

**CLASS 229**

23 R 4,129,246
36 4,129,247
41 B 4,129,248

**CLASS 233**

7 4,129,249

**CLASS 236**

44 A 4,129,250

**CLASS 237**

51 4,129,251

**CLASS 239**

2 R 4,129,252
88 4,129,253
96 4,129,254
4,129,255
4,129,256
458 4,129,257
650 4,129,258

**CLASS 241**

20 4,129,259
46 A 4,129,260
46.11 4,129,261
197 4,129,262
248 4,129,263
285 R 4,129,264

**CLASS 242**

58.2 4,129,265
68.4 4,129,266
107.4 A 4,129,267

**CLASS 244**

3.22 4,129,268
110 B 4,129,269
135 A 4,129,270
137 R 4,129,271
153 R 4,129,272
155 A 4,129,273
155 R 4,129,274
181 4,129,275

**CLASS 246**

169 S 4,129,276

**CLASS 248**

51 4,129,277
165 4,129,278
4,129,279
183 4,129,280

**CLASS 249**

54 4,129,281
137 4,129,282

**CLASS 250**

203 R 4,129,775
253 4,129,776
264 4,129,777
272 4,129,778
315 A 4,129,779
333 4,129,780
341 4,129,781
379 4,129,782
445 T 4,129,783
505 4,129,784
551 4,129,785

**CLASS 251**

62 4,129,283
205 4,129,284

**CLASS 252**

8.8 4,129,505
4,129,506
8.9 4,129,507
33 4,129,508
48.6 4,129,510
49.5 4,129,509
51.5 A 4,129,512
78.1 4,129,513
89 R 4,129,514
117 4,129,515
122 4,129,516
140 4,129,511
186 4,129,517
301.1 W 4,129,518
301.4 H 4,129,519
367 4,129,520
403 4,129,521
453 4,129,522
475 4,129,523
478 4,129,524
518 4,129,525
536 4,129,526
547 4,129,527

**CLASS 254**

78 4,129,285
103 4,129,286
134.3 PA 4,129,287

**CLASS 260**

23 EP 4,129,537
23 XA 4,129,535
4,129,536
23.7 M 4,129,538
27 R 4,129,539
28.5 A 4,129,540
28.5 AS 4,129,541
4,129,542
29.15 B 4,129,543
29.3 4,129,544
29.6 TA 4,129,545
31.8 T 4,129,546
33.4 R 4,129,547
37 M 4,129,548
40 R 4,129,549
42.22 4,129,550
45.7 R 4,129,551
45.85 R 4,129,553
45.9 QB 4,129,552
112 R 4,129,560
239 BB 4,129,561
239.3 P 4,129,562
239.57 4,129,564
239.9 4,129,563
307 F 4,129,568
307 FA 4,129,569
326.12 R 4,129,572
326.2 4,129,571
326.45 4,129,573
340.2 4,129,574
343.21 4,129,575
4,129,576
345.2 4,129,577
345.7 R 4,129,578
346.11 4,129,579
347.7 4,129,580
348.45 4,129,581
408 4,129,582
428.5 4,129,583
429.7 4,129,584
448.8 R 4,129,585
465 D 4,129,586
465.8 D 4,129,587
502.4 P 4,129,588
504 A 4,129,589
506 4,129,590
4,129,591
544 D 4,129,594
544 Y 4,129,595
561 K 4,129,596
563 P 4,129,597
570.8 R 4,129,598
586 E 4,129,599
604 R 4,129,600
651 F 4,129,602
653 4,129,603
656 R 4,129,604
669 A 4,129,605
674 R 4,129,606
823 4,129,528
4,129,555
4,129,558
4,129,700
835 4,129,607
836 4,129,608
837 R 4,129,609
4,129,610
858 4,129,611
860 4,129,612
861 4,129,613
876 B 4,129,614
4,129,615
878 R 4,129,616
879 4,129,617
884 4,129,618
901 4,129,619

**CLASS 261**

18 R 4,129,620
39 A 4,129,622
39 R 4,129,621
52 4,129,623
76 4,129,624
111 4,129,625
114 JP 4,129,626
151 4,129,627

**CLASS 264**

1 4,129,628
13 4,129,629
22 4,129,630
33 4,129,631
40.1 4,129,632
40.3 4,129,633
45.3 4,129,634
45.5 4,129,635
46.6 4,128,963
51 4,129,636
112 4,129,637
117 4,129,638
157 4,129,639
187 4,129,640
294 4,129,641

**CLASS 266**

158 4,129,288
195 4,129,289

**CLASS 267**

160 4,129,290

**CLASS 269**

73 4,129,291
126 4,129,292

**CLASS 270**

52 4,129,293

**CLASS 271**

93 4,129,294
186 4,129,295

**CLASS 272**

52 4,129,296
67 4,129,297

**CLASS 273**

100 4,129,298
102.2 S 4,129,299
176 A 4,129,300
186 R 4,129,301
236 4,129,302
241 4,129,303
243 4,129,304

**CLASS 274**

23 R 4,129,305

**CLASS 277**

30 4,129,306
34.3 4,129,307
188 R 4,129,308
189.5 4,129,309

**CLASS 280**

6 H 4,129,310
11.37 E 4,129,311
11.37 Z 4,129,312
12 H 4,129,313
87.01 4,129,315
96.1 4,129,316
281 R 4,129,317
289 A 4,129,318
425 R 4,129,314
615 4,129,319
628 4,129,245
744 4,129,320
4,129,321
766 4,129,322

**CLASS 285**

69 4,129,323
107 4,129,324

**CLASS 290**

52 4,129,786

**CLASS 292**

127 4,129,325

**CLASS 294**

8.6 4,129,326
58 4,129,327
65 4,129,328
70 4,129,329

**CLASS 296**

28 F 4,129,330
100 4,129,331

**CLASS 297**

440 4,129,332

**CLASS 298**

22 R 4,129,333

**CLASS 299**

4 4,129,334
17 4,129,335

**CLASS 301**

12 R 4,129,336

**CLASS 302**

2 A 4,129,338
2 R 4,129,337
21 4,129,339

**CLASS 303**

6 R 4,129,340
4,129,341
105 4,129,342

**CLASS 307**

11 4,129,788
118 4,129,789
203 4,129,790
252 Q 4,129,791
270 4,129,792
4,129,793
4,129,794

**CLASS 308**

35 4,129,343
187 4,129,344
191 4,129,345

**CLASS 310**

24 4,129,795
43 4,129,796
77 4,129,797
313 4,129,798
359 4,129,799

**CLASS 312**

324 4,129,346
330 R 4,129,347

**CLASS 313**

25 4,129,800
346 R 4,129,801
492 4,129,802

**CLASS 315**

3.5 4,129,803
169 TV 4,129,804
219 4,129,805
370 4,129,806
387 4,129,807

**CLASS 316**

20 4,129,348

**CLASS 318**

254 4,129,808
293 4,129,809
317 4,129,810
478 4,129,811
484 4,129,812
561 4,129,813
577 4,129,814
601 4,129,815
696 4,129,816

**CLASS 320**

18 4,129,817

**CLASS 322**

10 4,129,818
28 4,129,819

**CLASS 323**

43.5 R Re.29,860
56 4,129,820

**CLASS 324**

0.5 AH 4,129,822
8 4,129,821
16 S 4,129,828
20 R 4,129,823
29.5 4,129,824
52 4,129,825
57 H 4,129,831
57 SS 4,129,826
77 A 4,129,827
178 4,129,829
186 4,129,830

**CLASS 331**

44 4,129,832
66 4,129,833
91 4,129,834
94.5 D 4,129,836
94.5 G 4,129,835
107 A 4,129,837

**CLASS 333**

7 D 4,129,838
9 4,129,839
73 W 4,129,840
84 L 4,129,841

**CLASS 334**

15 4,129,842

**CLASS 335**

174 4,129,843
268 4,129,844

**CLASS 336**

57 4,129,845
84 C 4,129,846

**CLASS 337**

301 4,129,847

**CLASS 338**

21 4,129,849
308 4,129,848

**CLASS 339**

17 C 4,129,349
99 R 4,129,350
176 MP 4,129,351
177 R 4,129,352
242 4,129,353
265 F 4,129,354

**CLASS 340**

10 4,129,850
11 4,129,851
58 4,129,852
146.3 AG 4,129,853
146.3 CA 4,129,854
152 T 4,129,855
321 4,129,857
324 AD 4,129,858
4,129,859
4,129,860
324 R 4,129,861
347 AD 4,129,863
4,129,864
347 P 4,129,862
542 4,129,865
554 4,129,856

**CLASS 343**

5 R 4,129,866
6.8 R 4,129,867
4,129,868
4,129,869
106 R 4,129,870
727 4,129,871
768 4,129,872
854 4,129,873
4,129,874

**CLASS 346**

75 4,129,875
140 A 4,129,876

**CLASS 350**

6.7 4,129,355
96.23 4,129,356
157 4,129,357
173 4,129,358
183 4,129,359
289 4,129,360

**CLASS 351**

22 4,129,361
123 4,129,362

**CLASS 352**

29 4,129,363

**CLASS 353**

99 4,129,364
4,129,365

**CLASS 354**

24 4,129,366
83 4,129,367
128 4,129,368
197 4,129,369
234 4,129,370
4,129,371
271 4,129,877

**CLASS 355**

1 4,129,372
4,129,373
8 4,129,374
10 4,129,375
11 4,129,376
14 4,129,377
4,129,378
57 4,129,379
113 4,129,380

**CLASS 356**

36 4,129,381

| | |
|---|---|
| 71 | 4,129,382 |
| 244 | 4,129,385 |
| 381 | 4,129,384 |
| 439 | 4,129,383 |
| **CLASS 357** | |
| 13 | 4,129,878 |
| 22 | 4,129,879 |
| 27 | 4,129,880 |
| 82 | 4,129,881 |
| **CLASS 358** | |
| 13 | 4,129,882 |
| 104 | 4,129,883 |
| 188 | 4,129,884 |
| 190 | 4,129,885 |
| 194 | 4,129,886 |
| 213 | 4,129,887 |
| **CLASS 360** | |
| 40 | 4,129,888 |
| 75 | 4,129,889 |
| 94 | 4,129,890 |
| 98 | 4,129,891 |
| 130 | 4,129,892 |
| **CLASS 361** | |
| 21 | 4,129,893 |
| 117 | 4,129,894 |
| 257 | 4,129,895 |
| 371 | 4,129,896 |
| 399 | 4,129,897 |
| **CLASS 362** | |
| 7 | 4,129,898 |
| 109 | 4,129,899 |
| 217 | 4,129,900 |
| **CLASS 364** | |
| 104 | 4,129,901 |
| **CLASS 366** | |
| 88 | 4,129,386 |
| 119 | 4,129,387 |
| 124 | 4,129,388 |
| 144 | 4,129,389 |
| **CLASS 400** | |
| 121 | 4,129,390 |
| **CLASS 401** | |
| 208 | 4,129,391 |
| **CLASS 402** | |
| 46 | 4,129,396 |
| **CLASS 403** | |
| 25 | 4,129,392 |
| 49 | 4,129,393 |
| 57 | 4,129,394 |
| 317 | 4,129,395 |
| **CLASS 404** | |
| 14 | 4,129,397 |
| 95 | 4,129,398 |
| 118 | 4,129,399 |
| **CLASS 405** | |
| 31 | 4,129,006 |
| 169 | 4,129,010 |
| | 4,129,011 |
| 227 | 4,129,009 |
| 261 | 4,129,007 |
| 303 | 4,129,008 |
| **CLASS 408** | |
| 56 | 4,129,400 |
| 59 | 4,129,401 |
| **CLASS 415** | |
| 53 R | 4,129,402 |
| **CLASS 416** | |
| 134 A | 4,129,403 |
| **CLASS 417** | |
| 364 | 4,129,404 |
| **CLASS 418** | |
| 55 | 4,129,405 |
| **CLASS 422** | |
| 64 | 4,129,419 |
| 98 | 4,129,418 |
| **CLASS 423** | |
| 199 | 4,129,642 |
| 235 | 4,129,651 |
| **CLASS 424** | |
| 1 | 4,129,643 |
| 59 | 4,129,644 |
| 60 | 4,129,645 |
| 89 | 4,129,646 |
| 92 | 4,129,647 |
| 101 | 4,129,648 |
| 182 | 4,129,649 |
| 203 | 4,129,660 |
| 211 | 4,129,650 |
| 247 | 4,129,652 |
| 251 | 4,129,653 |
| | 4,129,654 |
| 263 | 4,129,656 |
| 267 | 4,129,655 |
| 273 R | 4,129,657 |
| | 4,129,661 |
| 274 | 4,129,658 |
| 283 | 4,129,659 |
| 305 | 4,129,662 |
| **CLASS 425** | |
| 46 | 4,129,406 |
| 87 | 4,129,407 |
| **CLASS 426** | |
| 7 | 4,129,664 |
| 432 | 4,129,665 |
| 602 | 4,129,663 |
| **CLASS 427** | |
| 3 | 4,129,666 |
| 44 | 4,129,667 |
| 57 | 4,129,668 |
| 282 | 4,129,669 |
| 386 | 4,129,670 |
| **CLASS 428** | |
| 48 | 4,129,671 |
| 138 | 4,129,672 |
| 172 | 4,129,673 |
| 285 | 4,129,674 |
| 288 | 4,129,675 |
| 315 | 4,129,676 |
| 372 | 4,129,677 |
| 383 | 4,129,678 |
| 398 | 4,129,679 |
| 433 | 4,129,680 |
| 524 | 4,129,681 |
| 571 | 4,129,682 |
| **CLASS 429** | |
| 21 | 4,129,683 |
| 27 | 4,129,684 |
| 38 | 4,129,685 |
| 61 | 4,129,686 |
| 86 | 4,129,687 |
| 97 | 4,129,688 |
| 101 | 4,129,689 |
| 104 | 4,129,690 |
| 197 | 4,129,691 |
| 234 | 4,129,692 |
| **CLASS 431** | |
| 3 | 4,129,409 |
| 251 | 4,129,408 |
| **CLASS 432** | |
| 31 | 4,129,410 |
| 58 | 4,129,411 |
| **CLASS 521** | |
| 38 | 4,129,534 |
| 79 | 4,129,530 |
| 94 | 4,129,531 |
| 106 | 4,129,693 |
| 107 | 4,129,694 |
| 108 | 4,129,695 |
| 117 | 4,129,533 |
| 154 | 4,129,696 |
| 176 | 4,129,697 |
| **CLASS 526** | |
| 3 | 4,129,698 |
| 42 | 4,129,699 |
| 65 | 4,129,701 |
| 71 | 4,129,702 |
| 73 | 4,129,703 |
| | 4,129,704 |
| 75 | 4,129,532 |
| 175 | 4,129,705 |
| 201 | 4,129,706 |
| 204 | 4,129,707 |
| 218 | 4,129,708 |
| 264 | 4,129,709 |
| 278 | 4,129,710 |
| 283 | 4,129,557 |
| 286 | 4,129,711 |
| 304 | 4,129,712 |
| 320 | 4,129,713 |
| 331 | 4,129,714 |
| **CLASS 528** | |
| 48 | 4,129,554 |
| 67 | 4,129,715 |
| 68 | 4,129,716 |
| 97 | 4,129,556 |
| 128 | 4,129,570 |
| 168 | 4,129,529 |
| 337 | 4,129,559 |
| 421 | 4,129,717 |
| **CLASS 536** | |
| 4 | 4,129,718 |
| 17 | 4,129,719 |
| | 4,129,720 |
| | 4,129,721 |
| 43 | 4,129,722 |
| **CLASS 542** | |
| 416 | 4,129,723 |
| 426 | 4,129,724 |
| | 4,129,725 |
| | 4,129,726 |
| | 4,129,727 |
| 429 | 4,129,728 |
| 439 | 4,129,729 |
| **CLASS 544** | |
| 21 | 4,129,730 |
| | 4,129,731 |
| 23 | 4,129,732 |
| 131 | 4,129,733 |
| | 4,129,734 |
| 132 | 4,129,735 |
| 189 | 4,129,736 |
| 279 | 4,129,737 |
| 281 | 4,129,738 |
| **CLASS 546** | |
| 121 | 4,129,567 |
| 142 | 4,129,565 |
| 326 | 4,129,566 |
| **CLASS 560** | |
| 21 | 4,129,739 |
| 48 | 4,129,740 |
| 50 | 4,129,741 |
| **CLASS 562** | |
| 549 | 4,129,592 |
| 557 | 4,129,593 |
| **CLASS 568** | |
| 593 | 4,129,601 |

## CLASSIFICATION OF DESIGNS

| | | |
|---|---|---|
| D2— | 233 | 250,496 |
| | 253 | 250,497 |
| D6— | 32 | 250,498 |
| | 83 | 250,499 |
| | 85 | 250,500 |
| | 191 | 250,501 |
| | 195 | 250,502 |
| | | 250,503 |
| | 242 | 250,504 |
| D7— | 40 | 250,505 |
| | 54 | 250,506 |
| | 187 | 250,507 |
| D8— | 1 | 250,508 |
| | 5 | 250,509 |
| | 40 | 250,510 |
| D9— | 254 | 250,511 |
| D10— | 64 | 250,512 |
| | 83 | 250,513 |
| | | 250,514 |
| | | 250,515 |
| D11— | 49 | 250,516 |
| | 67 | 250,517 |
| | 108 | 250,518 |
| | 118 | 250,519 |
| | 140 | 250,520 |
| | 176 | 250,521 |
| D12— | 1 | 250,522 |
| | 70 | 250,523 |
| | 146 | 250,524 |
| | 156 | 250,525 |
| | 157 | 250,526 |
| | 181 | 250,527 |
| D13— | 8 | 250,528 |
| | | 250,529 |
| | | 250,530 |
| | 10 | 250,531 |
| D14— | 3 | 250,532 |
| | 66 | 250,533 |
| | 96 | 250,534 |
| | | 250,535 |
| D15— | 116 | 250,536 |
| D19— | 70 | 250,537 |
| D23— | 28 | 250,538 |
| | 97 | 250,539 |
| | | 250,540 |
| | | 250,541 |
| | 150 | 250,542 |
| D24— | 9 | 250,543 |
| | 10 | 250,544 |
| | 47 | 250,545 |
| | 60 | 250,546 |
| D28— | 46 | 250,547 |
| | 79 | 250,548 |
| D30— | 20 | 250,549 |
| D34— | 5 L | 250,550 |
| | 5 SS | 250,551 |
| D87— | 1 D | 250,552 |
| | 1 R | 250,553 |
| D88— | 5 | 250,554 |
| D96— | 12 R | 250,555 |

## CLASSIFICATION OF PLANTS

| | | |
|---|---|---|
| P.— | 68 | 4,342 |
| | | 4,343 |
| | | 4,344 |
| | | 4,345 |
| | 80 | 4,346 |
| | 89 | 4,347 |

# GEOGRAPHICAL INDEX
# OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)


| | | | | | |
|---|---|---|---|---|---|
| Alabama | 1 | Kentucky | 21 | Oregon | 41 |
| Alaska | 2 | Louisiana | 22 | Pennsylvania | 42 |
| American Samoa | 3 | Maine | 23 | Puerto Rico | 43 |
| Arizona | 4 | Maryland | 24 | Rhode Island | 44 |
| Arkansas | 5 | Massachusetts | 25 | South Carolina | 45 |
| California | 6 | Michigan | 26 | South Dakota | 46 |
| Canal Zone | 7 | Minnesota | 27 | Tennessee | 47 |
| Colorado | 8 | Mississippi | 28 | Texas | 48 |
| Connecticut | 9 | Missouri | 29 | Utah | 49 |
| Delaware | 10 | Montana | 30 | Vermont | 50 |
| District of Columbia | 11 | Nebraska | 31 | Virginia | 51 |
| Florida | 12 | Nevada | 32 | Virgin Islands | 52 |
| Georgia | 13 | New Hampshire | 33 | Washington | 53 |
| Guam | 14 | New Jersey | 34 | West Virginia | 54 |
| Hawaii | 15 | New Mexico | 35 | Wisconsin | 55 |
| Idaho | 16 | New York | 36 | Wyoming | 56 |
| Illinois | 17 | North Carolina | 37 | U.S. Air Force | 57 |
| Indiana | 18 | North Dakota | 38 | U.S. Army | 58 |
| Iowa | 19 | Ohio | 39 | U.S. Navy | 59 |
| Kansas | 20 | Oklahoma | 40 | | |


(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

## PATENTS

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 : | 4,129,873 | | 4,129,527 | | 4,129,068 | | 4,129,381 | | 4,129,023 | | 4,129,503 |
| 6 : | 4,128,982 | | 4,129,588 | | 4,129,079 | | 4,129,460 | | 4,129,120 | | 4,129,582 |
| | 4,129,042 | | 4,129,595 | | 4,129,159 | | 4,129,505 | | 4,129,146 | | 4,129,623 |
| | 4,129,295 | | 4,129,613 | | 4,129,168 | | 4,129,522 | | 4,129,214 | | 4,129,693 |
| | 4,129,357 | | 4,129,616 | | 4,129,217 | | 4,129,575 | | 4,129,233 | | 4,129,712 |
| | 4,129,570 | | 4,129,632 | | 4,129,317 | | 4,129,576 | | 4,129,239 | | 4,129,718 |
| | 4,129,634 | | 4,129,661 | | 4,129,324 | | 4,129,606 | | 4,129,268 | | 4,129,724 |
| | 4,129,785 | | 4,129,669 | | 4,129,362 | | 4,129,607 | | 4,129,304 | | 4,129,725 |
| 9 : | 4,129,329 | | 4,129,671 | | 4,129,659 | | 4,129,624 | | 4,129,318 | | 4,129,726 |
| | 4,129,715 | | 4,129,682 | | 4,129,677 | | 4,129,626 | | 4,129,367 | | 4,129,727 |
| | 4,129,777 | | 4,129,758 | | 4,129,820 | | 4,129,701 | | 4,129,368 | | 4,129,733 |
| 01 : | 4,129,095 | | 4,129,768 | | 4,129,832 | | 4,129,714 | | 4,129,371 | | 4,129,734 |
| | 4,129,177 | | 4,129,775 | 13 : | 4,128,947 | | 4,129,773 | | 4,129,380 | | 4,129,789 |
| | 4,129,844 | | 4,129,781 | | 4,128,956 | | 4,129,816 | | 4,129,383 | | 4,129,817 |
| 04 : | 4,129,459 | | 4,129,788 | | 4,128,988 | | 4,129,852 | | 4,129,405 | | 4,129,892 |
| | 4,129,494 | | 4,129,799 | | 4,129,170 | | 4,129,865 | | 4,129,458 | 27 : | 4,128,981 |
| | 4,129,827 | | 4,129,805 | | 4,129,260 | | 4,129,885 | | 4,129,599 | | 4,128,984 |
| | 4,129,867 | | 4,129,810 | | 4,129,285 | 18 : | 4,128,905 | | 4,129,681 | | 4,129,113 |
| 06 : | 4,128,912 | | 4,129,815 | | 4,129,314 | | 4,128,924 | | 4,129,752 | | 4,129,135 |
| | 4,128,949 | | 4,129,821 | | 4,129,468 | | 4,129,052 | | 4,129,822 | | 4,129,223 |
| | 4,128,951 | | 4,129,823 | | 4,129,742 | | 4,129,055 | | 4,129,839 | | 4,129,299 |
| | 4,128,958 | | 4,129,847 | | 4,129,874 | | 4,129,074 | | 4,129,848 | | 4,129,300 |
| | 4,128,962 | | 4,129,863 | | 4,129,896 | | 4,129,076 | | 4,129,899 | | 4,129,322 |
| | 4,128,963 | | 4,129,883 | 17 : | 4,128,913 | | 4,129,082 | 26 : | 4,128,907 | | 4,129,633 |
| | 4,128,965 | | 4,129,888 | | 4,128,918 | | 4,129,107 | | 4,128,935 | 29 : | 4,129,048 |
| | 4,128,994 | | 4,129,891 | | 4,128,919 | | 4,129,119 | | 4,128,960 | | 4,129,066 |
| | 4,128,996 | 08 : | 4,129,085 | | 4,128,922 | | 4,129,127 | | 4,129,018 | | 4,129,528 |
| | 4,129,003 | | 4,129,116 | | 4,128,932 | | 4,129,200 | | 4,129,032 | | 4,129,568 |
| | 4,129,019 | | 4,129,179 | | 4,128,945 | | 4,129,202 | | 4,129,035 | | 4,129,597 |
| | 4,129,044 | | 4,129,206 | | 4,128,946 | | 4,129,341 | | 4,129,047 | | 4,129,625 |
| | 4,129,118 | | 4,129,853 | | 4,129,001 | | 4,129,417 | | 4,129,093 | | 4,129,729 |
| | 4,129,121 | 09 : | 4,128,929 | | 4,129,016 | | 4,129,444 | | 4,129,099 | | 4,129,754 |
| | 4,129,122 | | 4,128,937 | | 4,129,034 | | 4,129,464 | | 4,129,126 | 30 : | 4,129,393 |
| | 4,129,145 | | 4,128,957 | | 4,129,046 | | 4,129,465 | | 4,129,129 | 31 : | 4,128,916 |
| | 4,129,152 | | 4,128,968 | | 4,129,056 | | 4,129,536 | | 4,129,175 | | 4,128,976 |
| | 4,129,196 | | 4,129,059 | | 4,129,114 | | 4,129,721 | | 4,129,186 | 32 : | 4,129,005 |
| | 4,129,203 | | 4,129,067 | | 4,129,128 | | 4,129,811 | | 4,129,245 | | 4,129,140 |
| | 4,129,211 | | 4,129,092 | | 4,129,131 | 19 : | 4,129,101 | | 4,129,249 | | 4,129,301 |
| | 4,129,230 | | 4,129,191 | | 4,129,132 | 20 : | 4,129,058 | | 4,129,253 | | 4,129,346 |
| | 4,129,242 | | 4,129,532 | | 4,129,148 | | 4,129,069 | | 4,129,254 | 33 : | 4,129,187 |
| | 4,129,274 | | 4,129,567 | | 4,129,161 | | 4,129,096 | | 4,129,255 | | 4,129,348 |
| | 4,129,287 | | 4,129,578 | | 4,129,181 | | 4,129,106 | | 4,129,256 | 34 : | 4,128,941 |
| | 4,129,308 | | 4,129,683 | | 4,129,185 | 22 : | 4,129,088 | | 4,129,267 | | 4,128,954 |
| | 4,129,350 | | 4,129,685 | | 4,129,193 | | 4,129,388 | | 4,129,277 | | 4,128,959 |
| | 4,129,372 | | 4,129,728 | | 4,129,204 | 24 : | 4,129,006 | | 4,129,313 | | 4,128,966 |
| | 4,129,420 | | 4,129,732 | | 4,129,219 | | 4,129,087 | | 4,129,320 | | 4,129,060 |
| | 4,129,440 | 10 : | 4,129,275 | | 4,129,240 | | 4,129,252 | | 4,129,321 | | 4,129,094 |
| | 4,129,453 | | 4,129,456 | | 4,129,247 | | 4,129,694 | | 4,129,325 | | 4,129,110 |
| | 4,129,475 | | 4,129,663 | | 4,129,273 | | 4,129,747 | | 4,129,331 | | 4,129,199 |
| | 4,129,477 | 11 : | 4,129,210 | | 4,129,284 | | 4,129,793 | | 4,129,391 | | 4,129,205 |
| | 4,129,483 | 12 : | 4,128,938 | | 4,129,296 | | 4,129,862 | | 4,129,443 | | 4,129,266 |
| | 4,129,496 | | 4,128,989 | | 4,129,298 | | 4,129,864 | | 4,129,461 | | 4,129,326 |
| | 4,129,497 | | 4,129,033 | | 4,129,328 | 25 : | 4,128,985 | | 4,129,482 | | 4,129,349 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 4,129,395 | | 4,129,039 | | 4,129,710 | | 4,129,396 | | 4,129,112 | | 4,129,037 |
| | 4,129,415 | | 4,129,078 | | 4,129,748 | | 4,129,430 | | 4,129,139 | | 4,129,040 |
| | 4,129,423 | | 4,129,080 | | 4,129,776 | | 4,129,438 | | 4,129,172 | | 4,129,115 |
| | 4,129,433 | | 4,129,125 | | 4,129,779 | | 4,129,488 | | 4,129,176 | | 4,129,180 |
| | 4,129,452 | | 4,129,136 | | 4,129,783 | | 4,129,491 | | 4,129,188 | | 4,129,183 |
| | 4,129,525 | | 4,129,144 | | 4,129,790 | | 4,129,493 | | 4,129,198 | | 4,129,134 |
| | 4,129,535 | | 4,129,166 | | 4,129,835 | | 4,129,508 | | 4,129,229 | | 4,129,237 |
| | 4,129,538 | | 4,129,167 | | 4,129,857 | | 4,129,509 | | 4,129,278 | | 4,129,283 |
| | 4,129,544 | | 4,129,194 | | 4,129,861 | | 4,129,510 | | 4,129,279 | | 4,129,327 |
| | 4,129,566 | | 4,129,220 | | 4,129,870 | | 4,129,515 | | 4,129,323 | | 4,129,334 |
| | 4,129,569 | | 4,129,241 | | 4,129,872 | | 4,129,516 | | 4,129,402 | | 4,129,409 |
| | 4,129,571 | | 4,129,243 | | 4,129,879 | | 4,129,520 | | 4,129,416 | | 4,129,419 |
| | 4,129,580 | | 4,129,264 | | 4,129,887 | | 4,129,529 | | 4,129,448 | | 4,129,470 |
| | 4,129,584 | | 4,129,276 | | 4,129,895 | | 4,129,530 | | 4,129,476 | | 4,129,592 |
| | 4,129,594 | | 4,129,281 | 37 : | 4,129,015 | | 4,129,540 | | 4,129,479 | | 4,129,600 |
| | 4,129,604 | | 4,129,297 | | 4,129,017 | | 4,129,579 | | 4,129,489 | | 4,129,627 |
| | 4,129,628 | | 4,129,303 | | 4,129,246 | | 4,129,638 | | 4,129,490 | | 4,129,716 |
| | 4,129,653 | | 4,129,305 | | 4,129,259 | | 4,129,670 | | 4,129,534 | | 4,129,780 |
| | 4,129,655 | | 4,129,311 | | 4,129,386 | | 4,129,674 | | 4,129,547 | | 4,129,807 |
| | 4,129,662 | | 4,129,354 | | 4,129,427 | | 4,129,686 | | 4,129,561 | | 4,129,825 |
| | 4,129,667 | | 4,129,361 | | 4,129,429 | | 4,129,699 | | 4,129,614 | | 4,129,829 |
| | 4,129,676 | | 4,129,365 | | 4,129,675 | | 4,129,713 | | 4,129,615 | 49 : | 4,129,824 |
| | 4,129,680 | | 4,129,390 | | 4,129,880 | | 4,129,770 | | 4,129,619 | 51 : | 4,129,014 |
| | 4,129,708 | | 4,129,410 | 39 : | 4,128,928 | | 4,129,803 | | 4,129,637 | | 4,129,134 |
| | 4,129,709 | | 4,129,418 | | 4,128,952 | | 4,129,898 | | 4,129,641 | | 4,129,207 |
| | 4,129,720 | | 4,129,431 | | 4,128,969 | 40 : | 4,128,948 | | 4,129,646 | | 4,129,501 |
| | 4,129,722 | | 4,129,450 | | 4,128,972 | | 4,129,013 | | 4,129,666 | | 4,129,507 |
| | 4,129,731 | | 4,129,457 | | 4,128,995 | | 4,129,182 | | 4,129,707 | | 4,129,533 |
| | 4,129,739 | | 4,129,471 | | 4,129,007 | | 4,129,282 | | 4,129,735 | 53 : | 4,129,030 |
| | 4,129,743 | | 4,129,486 | | 4,129,162 | | 4,129,541 | | 4,129,744 | | 4,129,163 |
| | 4,129,751 | | 4,129,495 | | 4,129,208 | | 4,129,558 | | 4,129,749 | | 4,129,189 |
| | 4,129,753 | | 4,129,521 | | 4,129,212 | | 4,129,605 | | 4,129,809 | | 4,129,221 |
| | 4,129,795 | | 4,129,543 | | 4,129,213 | 41 : | 4,128,908 | | 4,129,843 | | 4,129,270 |
| | 4,129,804 | | 4,129,546 | | 4,129,224 | | 4,128,950 | | 4,129,845 | | 4,129,384 |
| | 4,129,813 | | 4,129,555 | | 4,129,225 | | 4,128,990 | | 4,129,849 | | 4,129,392 |
| | 4,129,826 | | 4,129,574 | | 4,129,228 | | 4,129,151 | | 4,129,866 | | 4,129,462 |
| | 4,129,836 | | 4,129,581 | | 4,129,235 | | 4,129,227 | 44 : | 4,128,955 | 54 : | 4,129,265 |
| | 4,129,871 | | 4,129,586 | | 4,129,244 | | 4,129,231 | | 4,129,850 | | 4,129,611 |
| | 4,129,876 | | 4,129,590 | | 4,129,262 | | 4,129,251 | 46 : | 4,129,258 | 55 : | 4,129,036 |
| | 4,129,882 | | 4,129,591 | | 4,129,292 | | 4,129,897 | 47 : | 4,129,425 | | 4,129,389 |
| | 4,129,893 | | 4,129,602 | | 4,129,293 | 42 : | 4,128,902 | | 4,129,463 | | 4,129,577 |
| 36 : | 4,128,939 | | 4,129,645 | | 4,129,316 | | 4,128,923 | | 4,129,723 | | 4,129,772 |
| | 4,129,020 | | 4,129,647 | | 4,129,336 | | 4,128,971 | 48 : | Re.29,860 | | 4,129,828 |
| | 4,129,025 | | 4,129,700 | | 4,129,338 | | 4,129,024 | | 4,128,973 | | 4,129,855 |
| | 4,129,028 | | 4,129,703 | | 4,129,385 | | 4,129,053 | | 4,129,026 | | 4,129,894 |
| | 4,129,031 | | 4,129,704 | | | | | | | | |

## DESIGN PATENTS

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 06 : | 250,504 | | 250,536 | | 250,521 | 19 : | 250,540 | | 250,531 | 41 : | 250,539 |
| | 250,512 | | 250,546 | | 250,523 | 21 : | 250,501 | 36 : | 250,500 | | 250,541 |
| | 250,519 | | | | | | | | | | |
| | 250,520 | 10 : | 250,502 | | 250,554 | 25 : | 250,516 | | 250,528 | 42 : | 250,551 |
| | 250,525 | | 250,503 | 18 : | 250,513 | | 250,517 | | 250,529 | 48 : | 250,499 |
| | 250,549 | 13 : | 250,532 | | 250,514 | 26 : | 250,507 | | 250,530 | 50 : | 250,498 |
| 09 : | 250,505 | 17 : | 250,510 | | 250,515 | 29 : | 250,522 | 39 : | 250,506 | 55 : | 250,555 |

☆ U. S. GOVERNMENT PRINTING OFFICE : O - 1978

## CHANGE OF ADDRESS FORM

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

Mail this form to: NEW ADDRESS

Superintendent of Documents
Government Printing Office SSOM
Washington, D.C. 20402

Attach last subscription label here.

---

## SUBSCRIPTION ORDER FORM

**SUBSCRIPTION ORDER FORM**

**ENTER MY SUBSCRIPTION TO:**

**@ $ Domestic; @ $ Foreign.**

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

**PLEASE PRINT OR TYPE**

(or) COUNTRY

☐ Remittance Enclosed (Make checks payable to Superintendent of Documents)

☐ Charge to my Deposit Account No. .....

**MAIL ORDER FORM TO:**
Superintendent of Documents
Government Printing Office
Washington, D.C. 20402

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

NEW COUNTRY

Attach a late subscription label here.

U.S. DEPARTMENT OF COMMERCE
Juanita M. Kreps, *Secretary*

PATENT AND TRADEMARK OFFICE
Donald W. Banner, *Commissioner*